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A Description of the 1984 Fishery, Stock Composition, and Biological Characteristics of Sockeye Salmon *(Oncorhynchus nerka)* in the Catch from Area 23, Barkley Sound

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A DESCRIPTION OF THE 1984 FISHERY, STOCK COMPOSITION, AND BIOLOGICAL CHARACTERISTICS OF SOCKEYE SALMON (Oncorhynchus nerka) IN THE CATCH FROM AREA 23, BARKLEY SOUND[1]

by

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ABSTRACT

Steer, G. J., N. B. F. Cousens, H. W. Stiff, K. D. Hyatt, and D. W. Welch. 1988. A description of the 1984 fishery, stock composition, and biological characteristics of sockeye salmon (Oncorhynchus nerka) in the catch from Area 23, Barkley Sound. Can. Tech. Rep. Fish. Aquat. Sci. No. 1667: 78 p.

The commercial net fishery for sockeye (Oncorhynchus nerka) in Area 23, Barkley Sound, intercepts fish bound for Great Central, Sproat, and Henderson Lakes. Parasite prevalence in samples from the catch were used in a regression model to estimate the contributions by these stocks. In 1984, the total commercial net catch of 914,310 sockeye was comprised primarily of Great Central fish (61% or 557,067), followed by Sproat fish (30% or 276,139) and then by Henderson fish (9% or 81,104). The estimates of age composition of the catch of Great Central sockeye were 43% age 4 and 56% age 5 fish, of Sproat sockeye were 25% age 4 and 50% age 5 fish, and of Henderson sockeye were 29% age 4 and 70% age 5 fish.

RÉSUMÉ

Steer, G. J., N. B. F. Cousens, H. W. Stiff, K. D. Hyatt, and D. W. Welch. 1988. A description of the 1984 fishery, stock composition, and biological characteristics of sockeye salmon (Oncorhynchus nerka) in the catch from Area 23, Barkley Sound. Can. Tech. Rep. Fish. Aquat. Sci. No. 1667: 78 p.

La pêche commerciale au filet du saumon rouge (Oncorhynchus nerka) dans la zone 23 (baie Barkley) intercepte les poissons qui se rendent dans les lacs Great Central, Sproat et Henderson. La prévalence de parasites dans des échantillons provenant des prises a été utilisée dans un modèle de régression afin d'évaluer l'apport par ces stocks. En 1984, les prises commerciales totales au filet de 914 310 saumons rouges comprenaient principalement les poissons du lac Great Central (61% ou 557 067), suivies des poissons du lac Sproat (30 % ou 276 139) puis les poissons du lac Henderson (9 % ou 81 104). Les estimations selon la composition par âge des saumons rouges capturés dans le lac Great Central étaient 43 % de poissons d'âge 4 et 56 % de poissons d'âge 5, pour les saumons capturés dans le lac Sproat, 25 % d'âge 4 et 50% d'âge 5, et pour les saumons capturés dans le lac Henderson, 29 % d'âge 4 et 70 % d'âge 5.

INTRODUCTION

Analysis of the stock recruitment relationship for a Pacific salmon (Oncorhynchus sp.) stock under harvest requires data on abundances of catch and escapement by brood and return year. The Enhancement Assessment Unit (EAU) of the Biological Sciences Branch is responsible for the assessment of net changes in adult sockeye (O. nerka) production resulting from fertilization of sockeye-nursery lakes (Hyatt and Stockner 1985). Part of this assessment involves assigning catch to brood year and stock, in cases where a fishery operates on multiple stocks, so that returns from treated and untreated brood years can be calculated for the stocks under study. We describe the commercial net fishery for sockeye salmon returning to three study stocks in Barkley Sound, our procedures and rationale in 1984 for sampling the catch, and a regression method which we use to estimate the abundance of catch by age and stock.

Three of the sockeye stocks under study by the EAU return to Great Central, Sproat, and Henderson Lakes, located on the west coast of Vancouver Island (Fig. 1). These stocks are harvested by a commercial net fishery that typically operates in a terminal fishing area (Area 23) from mid-June to late July each year (Hyatt and Raymond, unpublished data). The EAU or its predecessors have been involved in sampling this fishery since 1970 when lake fertilization was initiated at Great Central Lake as a sockeye enhancement technique. Great Central Lake has been fertilized each year from 1970 to 1973 and from 1977 to present, Henderson Lake from 1976 to present, and Sproat Lake in 1985 and 1986 (Hyatt and Steer 1987).

Sockeye returning to these lakes can be distinguished in the Area 23 catch by the presence or absence of the brain parasite Myxobolus neurobius and the muscle parasite Henneguya salminicola. These "parasite tags" are acquired by a characteristic proportion of juvenile sockeye from a particular stock during lake residence or during their downstream migration. The parasites are retained throughout ocean life and are detectable in adults returning to spawn (Quinn et al. 1987). The prevalence of parasite infection in samples of sockeye from the escapements are used in a regression model to estimate the proportion of each stock in the catch.

We collect catch data for the Barkley Sound sockeye stocks only from the Area 23 net fishery. The catch from these stocks in other fishing areas is likely negligible for two reasons. First, there is limited opportunity to harvest these stocks in adjacent areas because the stocks return early. They are vulnerable to interception in adjacent fishing areas only prior to the end of July since over 90% of the returns to Barkley Sound are in Area 23 by this time (Starr et al. 1984, Steer and Hyatt 1987). Second, most of the sockeye catch off the west coast of Vancouver Island is comprised of the Area 23 stocks. Of the total sockeye catch off the west coast of Vancouver Island from 1969 through 1986, 87% was landed in Area 23 (Fig. 2). Even if all sockeye landed in the adjacent areas (13%) were bound for Barkley Sound, these landings are small relative to the catch in Area 23.

The catch in Area 23 is taken over a large geographic area by numerous fishing vessels (Hyatt and Steer 1987) of various sizes operating during fishery openings of variable length. However, it is processed by relatively few canneries. During this consolidation and transportation process, the catch is well mixed (Steer et al. 1986). Our sampling program has capitalized on these features by taking samples from a few canneries where the catch is concentrated and it is less expensive to obtain a random sample than on the fishing grounds.

The stocks are harvested in Area 23 by a large fleet of commercial seine and gillnet fishing vessels that is controlled by regulation of the timing, duration, and spatial extent of net fishery openings (Hyatt and Raymond, unpublished data). Over 99% of the commercial catch of sockeye during net fishery openings in Area 23 is landed by purse seine and gillnet vessels (Steer et al. 1986). From 1980 through 1983, the net fishery was typically open 2 to 3 days per week for 5 to 8 weeks from early June to mid July. Opening day effort during these years ranged from 15 to 265 seine vessels and from 30 to 440 gillnet vessels with peak numbers occurring in late June or early July.

Although this fleet is large and dispersed over the fishing grounds, the catch is consolidated during the transportation process. Most of the seine and gillnet catch from an opening is collected on the fishing grounds by packer or collector vessels belonging to processors and cash buyers (Fig. 3). Typically, seines use a brailer to unload their catch directly to a packer on one or more occasions between sets during an opening. Gillnetters maintain a more continuous fishing effort by periodic transfer of their catch from temporary storage in side lockers ("checker boxes") to collector vessels. Fishing vessels of both types may deliver their catch to a processing plant after a fishery closure or may transfer their catch to processors via collectors and packers.

The catch is transported in fishing vessels, packers, and trucks to the processors. Packers leave when full or at the end of an opening to deliver their catch to the major processing plants in Vancouver and Steveston, or to land it at Bamfield, Ucluelet or Port Alberni, where it is processed locally or shipped via truck to the mainland processing plants. Trucks are used to rapidly convey the catch in optimum condition to the processors for the fresh fish market, usually early in the season, at the beginning of an opening when the packer will be required on the fishing grounds for several more days. Tally counts of sockeye caught by each type of gear are available from the packer skipper for all holds combined but not separately.

Two companies process nearly 60% of the Area 23 sockeye catch. British Columbia Packers Ltd. (BCP) received on average 51% of the Area 23 landings from 1980 through 1982 (Steer et al. 1986). BCP usually operates one packer to service its seine fleet and another, along with 2 to 6 collectors, to service its gillnet fleet. BCP stations a fish pump barge at Bamfield (Fig. 1) to transfer fish from collectors to packers and to consolidate loads among packers for efficient shipment to its Steveston plant. BCP operates several packers during peak openings and may subdivide the fishing grounds among them depending on fleet size, distribution, and catch. Canadian Fishing

Company Ltd. (CFC), receiving on average 7% of the Area 23 sockeye landings from 1980 through 1982 primarily from seine vessels, operates one packer to service its fleet. The remaining 42% is divided among cash buyers and other processors.

METHODS

SAMPLE SELECTION

Selection of samples from the landings at B.C. Packers and Canadian Fishing Company was not random. Instead, samples were selected to (1) characterize the age and stock composition of the catch of Area 23 sockeye by the gillnet and seine fleets, and (2) test hypotheses concerning differences in age and stock composition between samples due to the effects of fishing location and gear type. The first objective entailed obtaining one sample from the the gillnet catch and another from the seine catch in each weekly fishery. To minimize potential bias, we tried to obtain these samples from deliveries that were well mixed and made up of the catches from many fishing vessels. To meet the second objective, additional samples were taken. These samples were used to test some of the assumptions implicit in past years' programs for sampling the Area 23 sockeye catch; the results are presented in Steer et al. (1986).

Even though sample selection was directed, we treat the samples as though they were randomly selected. Steer et al. (1986) analysed for bias samples from the 1980 through 1984 Area 23 net fishery and found that although samples taken from peak catches late in the season may differ in stock composition due to fishing location and in age composition due to gear type, the age and stock composition of samples taken early in the season were not significantly different. They attributed this to the high degree of mixing of the catch during the transportation process. Samples from later openings are treated as random samples because data to permit stratification of the catch are not available.

The selection of samples was a function of availability and the range of choice of sources of samples varied with the magnitude of the weekly catch. When the commercial catch from a weekly opening was small, particularly during the early part of the season, there was usually only one packer per processor carrying a mix of seine and gillnet caught fish. On these occasions, a sample was obtained from whatever mix of catch was available at the BCP plant in Steveston on the scheduled sampling day, as this processor usually received the largest single share of the weekly catch. Occasionally, catch was separated by gear type among holds on the packer and samples were taken from the catch of each gear type. An additional pure sample of seine or gillnet caught fish was obtained if available on another packer or at another processing plant.

When catches were large, separate packers were used by BCP to collect catch from the seine and gillnet fishing areas, and pure samples by gear type were obtained either from separate packers or from separate holds on one packer. Occasionally more than one such "pure" sample was available and it was necessary to choose which packer to sample. Provided that the packers contained similar volumes of catch from a large number of vessels, the most convenient and least expensive one to sample was chosen. If one packer contained considerably fewer fish than another, fish from only a small number of deliveries or fish from a localized area, the packer with the larger volume of catch, larger number of deliveries or more widely distributed catch was sampled.

When pure samples by gear type could not be obtained, packers with a minimum amount of mixing between gear types were sampled to obtain "mostly gillnet" and "mostly seine" samples to approximately represent catch by gear type. If only mixed catch with substantial proportions from each gear type was available, a single sample was taken from the packer containing sockeye caught by gillnet and seine in proportions closest to the estimated proportions of gillnet and seine caught sockeye in the weekly catch.

SAMPLE COLLECTION

Sample collection at B.C. Packers

At BCP (Steveston), fish were unloaded from packer holds by a barge-mounted, air-lift type fish pump (Fig. 3). The intake, a funnel with maximum inside dimensions 40 X 70 cm, was lowered into the hold below the surface of the brine and suction applied to draw the mixture of brine and fish through the 30-cm diameter pump intake line. The brine was drained off and the fish passed by a system of bucket and belt conveyors to a small hopper. They were then fed by gravity at a controlled rate on to a conveyor belt table for manual sorting and grading. Other species and fish with fin-clips, indicating the presence of a coded wire tag, were removed. "High-grading", the removal of large sockeye in good condition for marketing as whole fresh or frozen fish, could also take place at this step but did not in 1984. The remaining sockeye were then carried into the processing and canning section of the plant by the conveyor system.

With the exception of one sample, all samples taken from packers unloading at BCP (Steveston) were obtained from the sorting and grading belt. At the start of unloading, the conveyor belt was stopped and all sockeye on the sorting table were removed manually to a 1.2 X 1.2 X 0.6 m tub until a sample of 105-110 fish had been obtained. This procedure minimized interference with the operation of the cannery. The only exception to this procedure was sample 3 from 7 June, which was obtained by withdrawing 100 sockeye at "random" from the moving belt throughout unloading.

Collection from the sorting belt represented a slight change from previous years, when the sample was obtained from a weighing hopper further along the conveyor system (Fig. 3). At the start of unloading and after the

removal of other species, fin-clipped and high-grade fish, sockeye were directed into the hopper from the conveyor and a weighed quantity of approximately 120-150 fish was dispensed into a tub for sampling. This procedure was not possible in 1984 due to modification of the dispensing hopper.

Samples 5 and 6 from 20 June were taken from landings delivered by truck to BCP (Steveston). The fish were packed under ice in 1.2 X 1.2 X 1.2 m "totes" and these were dumped one at a time into a water-filled bath to float off the ice. From the de-icing unit, the fish passed onto a sorting table where only non-sockeye and fin-clipped fish were removed. All sockeye were taken from the sorting table and transferred manually to a tub until approximately 110 fish had been obtained.

Sample Collection at Canadian Fishing Company

Procedures used for sample 12 from 6 July obtained from CFC were similar to those used at BCP. Fish were taken as a lot from an ungraded conveyor stream after removal of non-sockeye and tagged fish when the packer was unloaded by fish-pump. Sample 14 from 10 July was taken by dipnetting fish directly from the hold of a packer awaiting unloading at CFC because it was scheduled to be unloaded when the sampling crew would not be present. Fish could not be seen below the surface of the brine prior to removal so selection bias was unlikely. This procedure was only feasible when whole fish were being purchased and removed from the plant.

Sample Information

The following information was obtained for each sample from the packer skipper or occasionally from the unloading dock foreman or cannery office:

(i) Packer name
(ii) Date packer left Area 23
(iii) Catch on board by gear type
(iv) Confirmation that catch originated entirely from Area 23
(v) Fishing ground location within Area 23, if possible

Catch on board by gear type was calculated by summing the delivery slip receipts for vessels unloading to the packer and was available from the packer skipper or unloading foreman when the packer arrived. These numbers were later confirmed by obtaining actual delivery slip summary totals from the main cannery office.

SAMPLE PROCESSING

Once a lot of 100-150 sockeye had been set aside for sampling, 100 fish were withdrawn from the tub by hand without conscious selection or rejection of individual fish. Occasional fish were subsequently rejected if

they were too badly damaged to provide an accurate hypural length measurement (e.g. missing tail, separated spine, crushed head, etc.) or if they were too badly de-scaled to provide any scales from the vicinity of the preferred area (INPFC 1958).

Orbital-hypural length was measured to the nearest 0.5 cm with a standard "hypural stick" graduated in millimetres. The hypural stick consisted of a metre stick set in an aluminum channel with a stationary pin for the fish eye socket and a pin on a sliding cursor for alignment with the hypural plate.

Gillnets leave characteristic marks on fish and may be used to separate sockeye caught by gillnet from those caught by seine in samples from holds containing catches from both gear types. Presence of netmarks was recorded for individual fish taken from these holds. Sex of fish was determined by examining the gonads.

Both scales and otoliths were taken to age the fish. One to three scales were taken from each side of each fish from the preferred area above the lateral line and just posterior to the dorsal fin. When scales were absent in this area or were obviously regenerated following a wound and scarring, the nearest apparently undamaged scales above the lateral line were taken. Scales were preserved in labelled one-dram glass vials containing 3 ml of a solution of equal parts glycerol and water plus a few crystals of thymol.

To permit extraction of otoliths for ageing and examination of the brain for the parasite Myxobolus neurobius, heads were removed from the fish, placed in labelled plastic bags, and transported to the Pacific Biological Station, where they were stored in a cold room at 3°C for 12-60 hours before processing. In the laboratory, otoliths were removed from the heads and combined in the appropriate vial with scales from the same fish for subsequent ageing. Brains were extracted, inserted in numbered 15-ml conical centrifuge tubes and 10 ml of a solution of 2 g pepsin in 400 ml of 0.5% hydrochloric acid was added. The tubes were placed in a heated shaker bath at 38 to 40°C for 3 to 4 h and vigorously shaken by hand every 15 min. After digestion and centrifuging, a smear was made from the precipitated pellet and examined at 320X magnification with a compound microscope under phase contrast illumination for the presence of Myxobolus spores.

After examination at 20X magnification with a compound microscope, two scales were selected to provide the age information from the scale collection for each fish. The scales were cleaned in a solution of equal parts water and Pinesol to remove the glycerol, rinsed with water, blotted with soft paper towel and mounted on numbered scale cards. Acetate impressions of these cards were made in a heated scale press operated at 27 to 31 MPa (4000to 4500 psi) and 110 to 120°C for 4 min (Clutter and Whitesel 1956). Scale impressions were displayed at 100X magnification with a Leitz Neopromar microscope projection unit for age determination. Otoliths were cleared for at least 18 h in the 50% glycerol storage solution and then examined at 100X magnification with a compound microscope to count the annual rings. All scales and otoliths were examined initially by one reader and then examined a second time by another reader. If both readers agreed on the scale

and otolith ages, then scale and otolith ages were reconciled and a final age was assigned to each fish. Age is reported using the European system; the first digit corresponds to the number of winters spent in fresh water and the second to those spent in salt water.

To distinguish Henderson sockeye from Sproat sockeye in the catch, samples of whole fish were taken to permit examination for the muscle parasite Henneguya salminicola. Sockeye returning to spawn in Henderson Lake appear in the fishery in July (Starr et al. 1984). When this stock was present on the fishing grounds and in catch samples, samples of 100 whole fish were purchased from the processing plant and transported to the Pacific Biological Station where they were stored in a cold room at 3°C for 12-36 h while awaiting further processing. In addition to the processing described above, each fish was filleted and the flesh cut into transparent slices 5-7 mm thick. These slices were then visually examined for the presence of Henneguya cysts in the musculature. When necessary, cyst contents were examined at 320X magnification with a compound microscope to distinguish the Henneguya cysts from those of Diphyllobothrium sp., a larval cestode.

All data were recorded on waterproof "ALSOC" (Alberni Sockeye) data coding sheets (version #8405) in data entry format for keypunching. When complete, all data were proofed, verified, and entered into the Enhancement Assessment Unit, Area 23 Commercial Fishery Database resident on the VAX 11/780 minicomputer at the Pacific Biological Station.

COMMERCIAL FISHERY DATA

Daily counts of the number of gillnet and seine boats operating during each opening were made by Department of Fisheries and Oceans enforcement personnel from patrol vessels on the fishing grounds. Enumeration required approximately 2 h during which counts of fishing vessels were made from one patrol boat operating in Trevor Channel and Alberni Inlet and another operating in Imperial Eagle Channel (Fig. 1). Counts were made 1 h after the opening of the fishery and between 0600 and 0800 h on subsequent fishing days. Vessel counts summarized by us were obtained from Fishery Officer Weekly Catch Summary Sheets, available from the DFO District Office in Port Alberni.

Catch data by gear type for net fishery openings were obtained from the on-line catch data base (Wong 1983) resident on the VAX 11/780 minicomputer at the Pacific Biological Station.

STOCK COMPOSITION

Least squares regression estimates of the unknown proportion in the catch of sockeye from the three populations, θ_i, i=1,2,3, can be found as

follows. Denote $q_{k,i}$ as the proportion of fish from population i infected by one of the four possible combinations of the two parasites, k=1,..,4, where the four possible types of infections can be classified as [++,+-,-+,--] (Myxobolus : Hennequya) and are assumed known with negligible error. Then the proportion $p_{k,l}$ of the k=1,..,4 parasite categories observed in each of the l=1,..,N samples of 100 fish obtained from the catch during the season is:

$$(1) \qquad \underset{\sim}{P}_{4Nx1} = \underset{\sim}{Q}_{4Nx3}\,\underset{\sim}{\theta}_{3x1} + \underset{\sim}{E}_{4Nx1}$$

or

$$(2) \qquad p_{k,l} \cong q_{k,1}*\theta_1 + q_{k,2}*\theta_2 + q_{k,3}*\theta_3 + e_{k,l}$$

Assuming that the errors in each observation ($e_{k,l}$) are additive, the least squares solution for the relative contribution of each population to the catch is

$$(3) \qquad \hat{\underset{\sim}{\theta}} = [\underset{\sim}{Q}'\underset{\sim}{Q}]^{-1}\underset{\sim}{Q}'\underset{\sim}{P} \ ,$$

where ' indicates the matrix transpose, and $[\ ]^{-1}$ indicates the matrix inverse. This matrix expression is the standard equation for the least squares parameter estimates from a multiple regression model. In the present case, these parameters describe the contribution of fish from the ith population (Great Central Lake, Sproat Lake, and Henderson Lake) to the catch.

We used the REG procedure with parameters restricted to sum to one (SAS 1985) to fit this model to the sample data from the catch. We added the constraint $\Sigma\theta_l=1$ to the model because without it, the parameters summed to 0.998. We did not find it necessary to add the further constraint $\theta_l \geq 0$.

AGE COMPOSITION BY STOCK

To calculate the proportion of the catch by brood year i and stock j ($\theta_{i,j}$), we first assign individual sockeye to brood year and parasite class. Then for each brood year j=4,5, the proportion of the l=1,...,N samples of 100 sockeye observed in the jth age and k=1,...,4 parasite categories is:

$$(4) \qquad p_{j,k,l} = q_{k,1}*\theta_{1,j} + q_{k,2}*\theta_{2,j} + q_{k,3}*\theta_{3,j}$$

Proportions of 3 and 6 year old sockeye of each stock in the catch are not estimated by least squares regression because these age classes are relatively rare; there is little data with which to estimate their parameters. The proportion of each stock that is comprised of age 3 or 6 year old sockeye is estimated by subtracting the proportions of 4 and 5 year olds of a given stock in the catch from the proportion of that stock in the catch.

LENGTH OF SOCKEYE BY STOCK

For the analysis of length frequency by stock, we must assign individual fish to stock. The regression model does not do this so we used the following algorithm to allocate fish to stock based on the presence and absence of Myxobolus and Henneguya. We assigned all sockeye not infected with Myxobolus to the Great Central Lake stock. Of those infected with Myxobolus, sockeye infected with Henneguya were assigned to the Henderson Lake stock. Sockeye infected with Myxobolus but not with Henneguya were assigned to the Sproat Lake stock.

RESULTS

COMMERCIAL FISHERY OPERATION

The commercial net fishery for sockeye in Area 23 opened on June 3 and closed on July 17. During the 7-wk season, 450,400 (49%) sockeye were taken by gillnet vessels in six openings of 25.6 d total duration and 463,910 (51%) were taken by seine vessels in seven openings of 17.1 d total duration (Table 2). The total sockeye catch during the commercial net fishery openings was 914,310; 25% of this was taken by the end of the third opening (June 17 to 23), and 50% by the end of the fourth opening (July 1).

The allocation of catch to gear type of 49% to gillnet and 51% to seine partly resulted from a court injunction restricting fishery management options in Area 23. One objective of the 1984 fishing plan for harvest of sockeye in Area 23 was to allocate 60% of the net catch to seine vessels, operating in Alberni Inlet, and 40% to gillnet vessels, operating in the outer portion of Barkley Sound, by varying fishing times and areas subject to Somass escapement requirements of 350,000 (Austin 1984). The allocation objectives were altered for the last fishery in 1984 by a Federal Court of Canada order on July 13 that restrained the Department of Fisheries and Oceans from varying fishing quotas or times between gear types for net fisheries in Areas 12, 13, 16, and 23.

Gillnet and seine fleet distributions did not overlap in any fishery opening. For the first three gillnet and four seine openings, gillnets were restricted to subareas 23-3, 23-4, 23-5, and 23-6 (Fig. 1) and seines were restricted to subarea 23-2 and the south half of 23-1 (Hyatt and Raymond, unpublished data). For the next two gillnet and seine openings in July, gillnets were restricted to subareas 23-4, seaward of the Port Alberni harbour limit, 23-5, 23-6, and 23-7 while seines were restricted to subareas 23-1, south of Dunsmuir Point, 23-2, 23-3, and 23-4, inside the harbour limit. For the final gillnet and seine opening, open subareas were the same as in the previous opening except that in subarea 23-6 gillnets fished seaward of the Port Alberni harbour limit and seines in that subarea fished inside the harbour limit.

Fishing effort in 1984 was substantial, with peak vessel counts of 551 gillnets on June 17 and 338 seines on July 8 (Fig. 4a), exceeding those of the previous four years (Authors, unpublished data). The number of gillnet boats exceeded the number of seine boats for all counts except the last of the season. Vessel numbers varied both between openings, with gillnet counts peaking before seine counts, and within openings, with effort of both gear types tending to decline throughout an opening (Fig. 4a). A 12-d gillnet opening at the end of the season resulted from an extension on June 20 and this may explain why its effort pattern is inconsistent with that of previous openings. Examination of effort data from the previous four years revealed similar trends within openings for both gear types. Fisheries were of 3 d duration for the first 5 seine openings and 4, 5, 12, and 3 d for the first 4 gillnet openings. The last two seine and gillnet openings were of 1 d duration.

Seine catch and catch per unit effort (fish per boat-day) were greatest in the last opening, the 3rd week in July, when 152,541 sockeye were caught by 205 boats in a single day (744 fish per boat-day). Weekly gillnet catches were highest during the last two weeks of June and first week in July, although catch per unit effort was highest in the first (81 fish per boat-day) and third (79 fish per boat-day) weeks in July. Catch by gillnet exceeded that by seine for openings prior to July 3 (Fig. 4b).

SAMPLE SELECTION

Of the 17 samples collected, 13 were obtained from packers with recirculating brine systems unloading at the B.C. Packers (BCP) processing plant in Steveston, two from vessels of the same type unloading at the Canadian Fishing Co. (CFC) processing plant in Vancouver and two from trucks unloading to the fresh fish section at the BCP (Steveston) plant. Sample summaries are presented in Table 3. Data on individual sockeye in the samples are presented in Appendix I.

AGE AND STOCK COMPOSITION

Prevalence of infection with Myxobolus and Henneguya parasites in samples of sockeye from the 1984 commercial net catch (Table 4) and in samples from the escapements of sockeye to Great Central, Sproat, and Henderson lakes in 1984 (Table 1) were used in our least squares regression model to estimate the overall contribution and contribution by brood year of these stocks to the catch in 1984. Parameter estimates of the proportions of the catch by stock and the proportions of the catch of age 4 and 5 year olds by stock were significant (All $P(\theta_i=0)<0.05$, Table 5). The total commercial net catch of 914,310 sockeye (Table 6) was comprised primarily of Great Central fish (61% or 557,067), followed by Sproat fish (30% or 276,139) and then by Henderson fish (9% or 81,104). Nearly all of the catch of each of the three stocks was made up of age 4 and 5 year old sockeye from the 1980 and 1979 brood years,

respectively, with the contribution of age 5 fish exceeding that of age 4. The estimates of age composition of the catch of Great Central sockeye were 43% age 4 and 56% age 5 fish, of Sproat sockeye were 25% age 4 and 50% age 5 fish, and of Henderson sockeye were 29% age 4 and 70% age 5 fish.

We tested the appropriateness of our regression models by testing for lack of fit (Draper and Smith 1981). There was no significant lack of fit of the overall stock composition model fit to data from the samples analyzed for Myxobolus only ($F_{7,4}$=2.69, P>0.05) nor to data from the samples analyzed for Myxobolus and Henneguya ($F_{10,16}$=1.28, P>0.05). There was no significant lack of fit of the brood year composition regression model fit to data on age 4 sockeye from the samples analyzed for Myxobolus only ($F_{6,4}$=3.33, P>0.05), to data on age 4 sockeye from the samples analyzed for Myxobolus and Henneguya ($F_{9,16}$=1.42, P>0.05), or to data on age 5 sockeye from the samples analyzed for Myxobolus and Henneguya ($F_{9,16}$=0.48, P>0.05). There was significant lack of fit of the brood year composition regression model fit to data on age 5 sockeye from the samples analyzed for Myxobolus only ($F_{6,4}$=92.6, P<0.005). Because we found significant lack of fit in only one of six tests we conclude that the models are reasonable.

LENGTH OF SOCKEYE

Mean length of Barkley Sound sockeye in the catch is primarily influenced by the number of years spent in the marine environment. Age 1.3 and 2.3 fish have similar mean lengths which are greater than those of age 1.2 and 2.2 fish, which are similar (Figs. 6, 7 and 8). In all cases but one (GCL 2.3), males are longer than females in the same age and stock category (range of difference in mean length is 4.6 to 28.0 mm). There are no obvious differences due to stock between lengths of sockeye within an age and sex category.

DISCUSSION

Our regression model ranked the relative abundance of the three Barkley Sound sockeye stocks in the 1984 Area 23 sockeye catch as Great Central>Sproat>Henderson. This ranking is the same as that reported by Manzer (1976) who prorated catch to stock using relative escapements of the two Somass River stocks, Great Central and Sproat, and considered the contribution of Henderson to be negligible. Our estimates of the proportion of the catch attributable to Henderson (9%) and Sproat (30%) are different from those reported in Hyatt and Steer (1987), 5% and 35%, but our estimate of the proportion of Great Central in the catch (61%) is the same as the 60% reported

in Hyatt and Steer (1987). They assigned individual sockeye to stock using the same algorithm that we used to assign fish to stock for length analysis. It assumes complete presence or absence of parasites and misclassifies 34% of the Henderson sockeye as Sproat sockeye.

Our finding that the catch of sockeye in 1984 was comprised primarily of 5 year old fish is inconsistent with that of Manzer (1976), who reported that from 1960 through 1975, the commercial catch of sockeye in Barkley Sound was primarily comprised of age 1.2 (4 year old) sockeye (mean proportion 71.2%) and age 1.3 (5 year old) sockeye (mean proportion 17.5%). With only one year of recent data, it is difficult to speculate on the cause of this apparent difference. The difference may result from variations in brood year escapement, marine survival rate, or changes in rate of maturation.

Several features of the regression models we used to estimate the abundance of the catch by age and stock are attractive. First, they are inherently simple and the parameter estimates are directly obtainable without the need for complicated calculations, particularly when the regression parameters are not constrained. This is desirable from a management standpoint, since in-season estimates of the catch composition can be obtained with a hand calculator. Second, confidence intervals and joint confidence regions about these point estimates are available (Goodman 1965), permitting assessment of the uncertainty in the estimated stock composition. Third, the way in which the data were collected permits testing the models for lack of fit (Draper and Smith 1981) by partitioning the observations into periods (weeks) during which the composition of the catch changed little. The replicate samples can then be used to provide repeated observations of the proportions of the catch according to the four possible parasite infection groupings. This allows a comparison of the variability between observations within weeks with the variability about the fitted model of the weekly means. Systematic failure of the model to describe the true population proportions will inflate the latter variance estimate.

Several assumptions and limitations of the regression models we have proposed must be stressed. First, we assume that the errors inherent in the observations are additive so that least squares regression may be applied. Second, we assume that the proportion of the fish infected by the two parasites is known with negligible error for each lake population, so that we can neglect uncertainty from this source. When these assumptions are incorrect the regression approach is inappropriate. In this case, we must reformulate the model as an errors in variables problem and the statistical treatment becomes substantially more difficult (Fournier et al. 1984, Wood et al. 1987). Third, we have implicitly assumed that the rates of infection are constant across age classes within a stock.

The Barkley Sound sockeye fishery is probably the best example in British Columbia of a fishery meeting assumptions of our regression models for estimating abundance of catch by age and stock. We are currently working on including confidence limits to our estimates of the catch composition, and we intend to compare the current method with the constrained maximum likelihood procedure of Fournier et al. (1984) and Wood et al. (1987) in a future publication. However, we expect our model to compare well with that

procedure. For samples of 180 or more fish from a mixture of three stocks in equal proportions, Mulligan et al. (1988) compared estimates of parameters and their standard deviations from the maximum likelihood model with those from a constrained least squares model and found that although there were negligible differences between the mean parameter estimates from the two techniques, the standard deviations of the parameter estimates from the least squares model were 20% to 30% greater than those from the maximum likelihood model. For the Area 23 catch, we expect that the differences in results from the two techniques will be less since our sample sizes are larger, ranging from 295 to 849 fish. We also intend to test the implicit assumption of constant rates of sockeye parasitisation in the lakes as more data become available.

Our observation that length at age is primarily influenced by the sex and the number of years spent in the marine environment has been made for a number of sockeye stocks. Ricker (1982) analysed the weights of sockeye from the commercial catch in fishing areas along the coast of British Columbia and concluded that size increased with length of ocean life. He also found that mean fork length of male sockeye tended to exceed that of female sockeye in a given age class. Mean length of male sockeye was also greater than that for female sockeye in the same age class in commercial gillnet and purse-seine catches from fisheries off the southeast coast of Alaska in 1985 (McPherson and McGregor 1986).

The algorithm we used to assign individual sockeye to stock for the analysis of length misclassifies a small number of fish because it assumes 100% rates of infection. This results in the misclassification of 3.8% of the Great Central sockeye in the samples and 34% of the Henderson sockeye as Sproat fish (Table 1). There is no misclassification of either Sproat or Great Central sockeye as Henderson fish and only 0.1% of the Sproat sockeye and 1% of the Henderson sockeye are misclassified as Great Central fish. Assuming a stock composition of 60% Great Central, 30% Sproat and 10% Henderson (typical values estimated from the previous regression analysis), this algorithm will result in misclassification of two Great Central sockeye and three Henderson sockeye as Sproat sockeye, in a sample of 100 fish.

We intend to further evaluate this algorithm and its potential bias in the analysis of length of sockeye in the Area 23 catch. First, we will compare the results here with results from an analysis of length of sockeye in the escapements of the three stocks. Second, we will compare them with the results from an analysis of length of sockeye in the catch where individual sockeye are assigned to stock based on scale circulus counts. These two analyses will provide independent assessments of the potential bias in the analysis of length by stock produced by our simple algorithm.

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Table 1. Prevalence of infection with Myxobolus neurobius and Henneguya salminicola parasites in sockeye samples from the escapements to Great Central, Sproat, and Henderson Lakes in 1984. Calculated from data in Quinn et al. (1987).

	Myxobolus		Myxobolus / Henneguya			
	+	-	+/+	+/-	-/+	-/-
Stock						
GCL	3.8	96.2	0.0	3.8	0.5	95.7
SPR	99.9	0.1	0.0	99.9	0.0	0.1
HEN	99.0	1.0	65.0	34.0	0.7	0.3

Table 2. 1984 Area 23 sockeye net fishery summary data. Week # is number of weeks since January 1. Total Boat Days is average number of boats per day multiplied by the number of days open. Average number of boats per day is calculated by averaging all counts recorded for an opening on the Fishery Officer Weekly Catch Summary Sheets. Catch is from the DFO Catch Summary Database on the VAX 11/780 minicomputer at the Pacific Biological Station (Wong 1983).

	Gear Type																
	Seine								Gillnet								Total
	Duration								Duration								
	Open		Closed		# Days Open	Total Boat Days	Catch (Pieces)	C/f (#/Boat Day)	Open		Closed		# Days Open	Total Boat Days	Catch (Pieces)	C/f (#/Boat Day)	Catch (Pieces)
	Date	Time	Date	Time					Date	Time	Date	Time					
Week #																	
1	03JUN	15:00	06JUN	15:00	3.0	121	7,831	64.9	03JUN	15:00	07JUN	15:00	4.0	762	14,922	19.6	22,753
2	10JUN	15:00	13JUN	15:00	3.0	266	15,908	59.7	10JUN	15:00	15JUN	9:00	4.8	1,628	60,738	37.3	76,646
3	17JUN	18:00	20JUN	18:00	3.0	405	47,098	116.3	17JUN	18:00	24JUN	18:00	7.0	3,318	110,956	33.4	158,054
4	24JUN	15:00	27JUN	18:00	3.1	368	17,590	47.8	24JUN	18:00	29JUN	12:00	4.8	1,702	125,949	74.0	143,539
5	01JUL	15:00	04JUL	15:00	3.0	626	102,669	164.1	01JUL	15:00	04JUL	15:00	3.0	1,250	101,435	81.2	204,104
6	08JUL	15:00	09JUL	15:00	1.0	325	120,273	370.6	08JUL	15:00	09JUL	15:00	1.0	386	19,499	50.5	139,772
7	16JUL	15:00	17JUL	15:00	1.0	205	152,541	744.1	16JUL	15:00	17JUL	15:00	1.0	213	16,901	79.3	169,442
Total					17.1	2,315	463,910	200.4					25.6	9,259	450,400	48.6	914,310

Table 3. Sample Information. Date left refers to the date the packer/truck left the fishing grounds and landed date to the date the sample was taken at the cannery. Sample # is sample number and n is sample size. Total sockeye is total sockeye on board the vessel/truck. Number of deliveries is equivalent to number of delivery slips which corresponds to number of catch transfers from fishing vessels to packers or collectors. All samples were taken at B.C.Packers Ltd., Steveston (BCP) except samples 1 2 & 14 taken at Canadian Fishing Co., Vancouver (CFC). Samples 9, 10 & 13-17 were purchased as whole fish for Henneguya salminicola processing.

Date Left	Date Landed	Sample #	n	Packer	Total Sockeye	Gear	Notes
06 Jun	07 Jun	1	100	Western Star	355	sn	BCP: 279 Deliveries (3 sn, 276 gn)
		2	100		3,241	gn	Sample 1: Start of unloading.
		3	100		------		2: End of unloading.
					3,596		3: Random during unloading.
14 Jun	15 Jun	4	100	Western Star	2,210	sn	BCP: 204 deliveries (20 sn, 184 gn)
					4,043	gn	

					6,253		
19 Jun	20 Jun	5	100	Pakalot	10,357	gn	BCP: 244 gn deliveries. Trucked from Ucluelet.
		6	150	Shogun	8,992	sn	BCP: 99 deliveries (47 sn, 52 gn)
					1,980	gn	Trucked from Port Alberni.

					10,972		
27 Jun	28 Jun	7	100	Western Star	711	sn	BCP: 555 deliveries (22 sn, 533 gn)
		8	100		17,265	gn	Sample 1 from Hold #2.
					------		2 from Hold #1 (fwd hold).
					17,976		
03 Jul	04 Jul	9	104	Norking	12,186	sn	BCP: 39 sn deliveries. Whole fish.
04 Jul	05 Jul	10	100	Pakalot	8,255	gn	BCP: 230 gn deliveries. Whole fish
		11	100	Western Star	13,910	sn	BCP: 157 deliveries (71 sn, 86 gn)
					8,588	gn	

					22,598		

Table 3 (cont'd)

Date Left	Date Landed	Sample #	n	Packer	Total Sockeye	Gear	Notes
	05 Jul	12	100	Miss Crewe	15,039	sn	CFC.
09 Jul	10 Jul	13	100	WG-401	1,476	sn	BCP: 241 deliveries (9 sn, 232 gn)
					5,552	gn	Whole fish purchased.
					7,028		
		14	100	Cape Pine	18,000	sn	CFC. 50 fish from each of 2 fwd holds. Whole fish purchased.
17 Jul	18 Jul	15	100	Western Star	15,187	sn	BCP: 38 deliveries (31 sn, 7 gn)
					162	gn	Sample all sn from Hold #2.
					15,349		Deliveries from lower seine area[1] Whole fish purchased.
		16	100	Canadian Pine	16,538	sn	BCP: 30 sn deliveries. From upper seine area[1]. Whole fish purchased.
		17	100	Norking	10,623	sn	BCP: 130 deliveries (16 sn, 114 gn)
					3,898	gn	Sample first 100 from hold. Gn
					14,521		added last. Sn from lower sn area[1]. Whole fish purchased.

[1]Upper seine area is north-easterly portion of area open to seine fishing and lower seine area is south-westerly portion.

Table 4. Prevalence of infection with Myxobolus neurobius and Henneguya salminicola parasites in sockeye samples from the 1984 Area 23 net fishery. Opening is date fishery opened. n is sample size. "All" includes aged and unaged sockeye.

			Myxobolus		Myxobolus / Henneguya				
			+	-	+/+	+/-	-/+	-/-	n
Opening	Sample	Age							
03JUN84	1-3	4	22.0	16.8					113
		5	27.8	31.6					173
		6	1.0	0.7					5
		All	51.0	49.0					300
10JUN84	Sample	Age							
	4	4	8.1	19.2					27
		5	20.2	51.5					71
		6	1.0	0.0					1
		All	29.3	70.7					99
17JUN84	Sample	Age							
	5	4	19.2	23.2					42
		5	18.2	34.3					52
		6	2.0	3.0					5
		All	40.0	60.0					100
	6	Age							
		4	20.7	23.4					64
		5	19.3	35.9					80
		6	0.7	0.0					1
		All	42.0	58.0					150
24JUN84	Sample	Age							
	7	4	18.4	27.6					45
		5	22.4	29.6					51

(Continued)

Table 4 (cont'd)

			Myxobolus		Myxobolus / Henneguya				
			+	-	+/+	+/-	-/+	-/-	n
Opening	Sample	Age							
24JUN84	7	6	1.0	1.0					2
		All	43.0	57.0					100
	8	Age							
		4	11.1	36.4					47
		5	21.2	30.3					51
		6	1.0	0.0					1
		All	33.0	67.0					100
01JUL84	Sample	Age							
	9	3	2.1	0.0	0.0	2.1		0.0	2
		4	14.6	24.0	1.0	13.5		24.0	37
		5	13.5	44.8	1.0	12.5		44.8	56
		6	1.0	0.0	0.0	1.0		0.0	1
		All	30.8	69.2	1.9	28.8		69.2	104
	10	Age							
		4	13.4	38.1	0.0	13.4		38.1	50
		5	19.6	28.9	1.0	18.6		28.9	47
		All	32.0	68.0	1.0	31.0		68.0	100
	11	Age							
		4	27.8	27.8					54
		5	18.6	24.7					42
		6	0.0	1.0					1
		All	47.0	53.0					100

(Continued)

Table 4 (cont'd)

			Myxobolus		Myxobolus / Henneguya				
			+	-	+/+	+/-	-/+	-/-	n
Opening	Sample	Age							
01JUL84	12	3	1.1	0.0					1
		4	13.3	25.6					35
		5	12.2	43.3					50
		6	1.1	3.3					4
		All	30.0	70.0					100
08JUL84	Sample	Age							
	13	4	20.7	25.0	3.3	17.4		25.0	42
		5	20.7	30.4	2.2	18.5		30.4	47
		6	2.2	1.1	0.0	2.2		1.1	3
		All	40.4	59.6	5.1	35.4		59.6	99
	14	Age							
		4	20.0	21.1	4.2	15.8	0.0	21.1	39
		5	28.4	27.4	16.8	11.6	1.1	26.3	53
		6	1.1	2.1	1.1	0.0	0.0	2.1	3
		All	49.0	51.0	21.0	28.0	1.0	50.0	100
16JUL84	Sample	Age							
	15	4	23.6	24.7	6.7	16.9	1.1	23.6	43
		5	32.6	19.1	16.9	15.7	0.0	19.1	46
		All	56.4	43.6	23.4	33.0	1.1	42.6	94
	16	Age							
		3	0.0	1.0	0.0	0.0		1.0	1
		4	17.2	20.2	0.0	17.2		20.2	37

(Continued)

Table 4 (cont'd)

			Myxobolus		Myxobolus / Henneguya				
			+	-	+/+	+/-	-/+	-/-	n
Opening	Sample	Age							
01JUL84	12	3	1.1	0.0					1
		4	13.3	25.6					35
		5	12.2	43.3					50
		6	1.1	3.3					4
		All	30.0	70.0					100
08JUL84	Sample	Age							
	13	4	20.7	25.0	3.3	17.4		25.0	42
		5	20.7	30.4	2.2	18.5		30.4	47
		6	2.2	1.1	0.0	2.2		1.1	3
		All	40.4	59.6	5.1	35.4		59.6	99
	14	Age							
		4	20.0	21.1	4.2	15.8	0.0	21.1	39
		5	28.4	27.4	16.8	11.6	1.1	26.3	53
		6	1.1	2.1	1.1	0.0	0.0	2.1	3
		All	49.0	51.0	21.0	28.0	1.0	50.0	100
16JUL84	Sample	Age							
	15	4	23.6	24.7	6.7	16.9	1.1	23.6	43
		5	32.6	19.1	16.9	15.7	0.0	19.1	46
		All	56.4	43.6	23.4	33.0	1.1	42.6	94
	16	Age							
		3	0.0	1.0	0.0	0.0		1.0	1
		4	17.2	20.2	0.0	17.2		20.2	37

(Continued)

Table 5. Estimates of the proportions of the catch of sockeye by stock, the proportions of the catch of age 4 sockeye by stock, and the proportions of the catch of age 5 sockeye by stock. N is the number of observations used in the regression.

				θ_1			Prob(θ_1=0)		
Parasite	Samples	Age	N	GCL	Spr	Hen	GCL	Spr	Hen
Myx	1-8	4	12	0.254	0.156	*	0.0001	0.0001	*
Myx/Hen	9,10,13-17	4	28	0.265	0.135	0.045	0.0001	0.0001	0.0289
Myx	1-8	5	12	0.369	0.202	*	0.0001	0.0001	*
Myx/Hen	9,10,13-17	5	28	0.314	0.104	0.111	0.0001	0.0013	0.0090
Myx	1-8	All	12	0.626	0.374	*	0.0001	0.0001	*
Myx/Hen	9,10,13-17	All	28	0.596	0.246	0.158	0.0001	0.0001	0.0014

Table 6. Proportion and abundance by brood year of Great Central, Sproat, and Henderson sockeye in the 1984 Area 23 net catch. Proportions of the catch of age 4 and 5 year old sockeye by stock and proportions of the catch of sockeye by stock were estimated by least squares regression. Proportions of age 3 and 6 year old sockeye (3,6) in the catch were estimated by subtraction. Due to estimation and round off errors, stock abundances may not sum to total catch.

			Stock					
			Great Central		Sproat		Henderson	
Opening	Catch	Age	Prop	Catch	Prop	Catch	Prop	Catch
1-4	400,992	4	0.254	101,799	0.156	62,648		
		5	0.369	148,051	0.210	84,404		
		3,6	0.003	1,279	0.007	2,810		
		Tot	0.626	251,129	0.374	149,863		
5-7	513,318	4	0.265	136,208	0.135	69,126	0.045	23,032
		5	0.314	161,105	0.104	53,568	0.111	56,808
		3,6	0.017	8,625	0.007	3,582	0.002	1,264
		Tot	0.596	305,938	0.246	126,276	0.158	81,104
Total	914,310		0.609	557,067	0.302	276,139	0.089	81,104

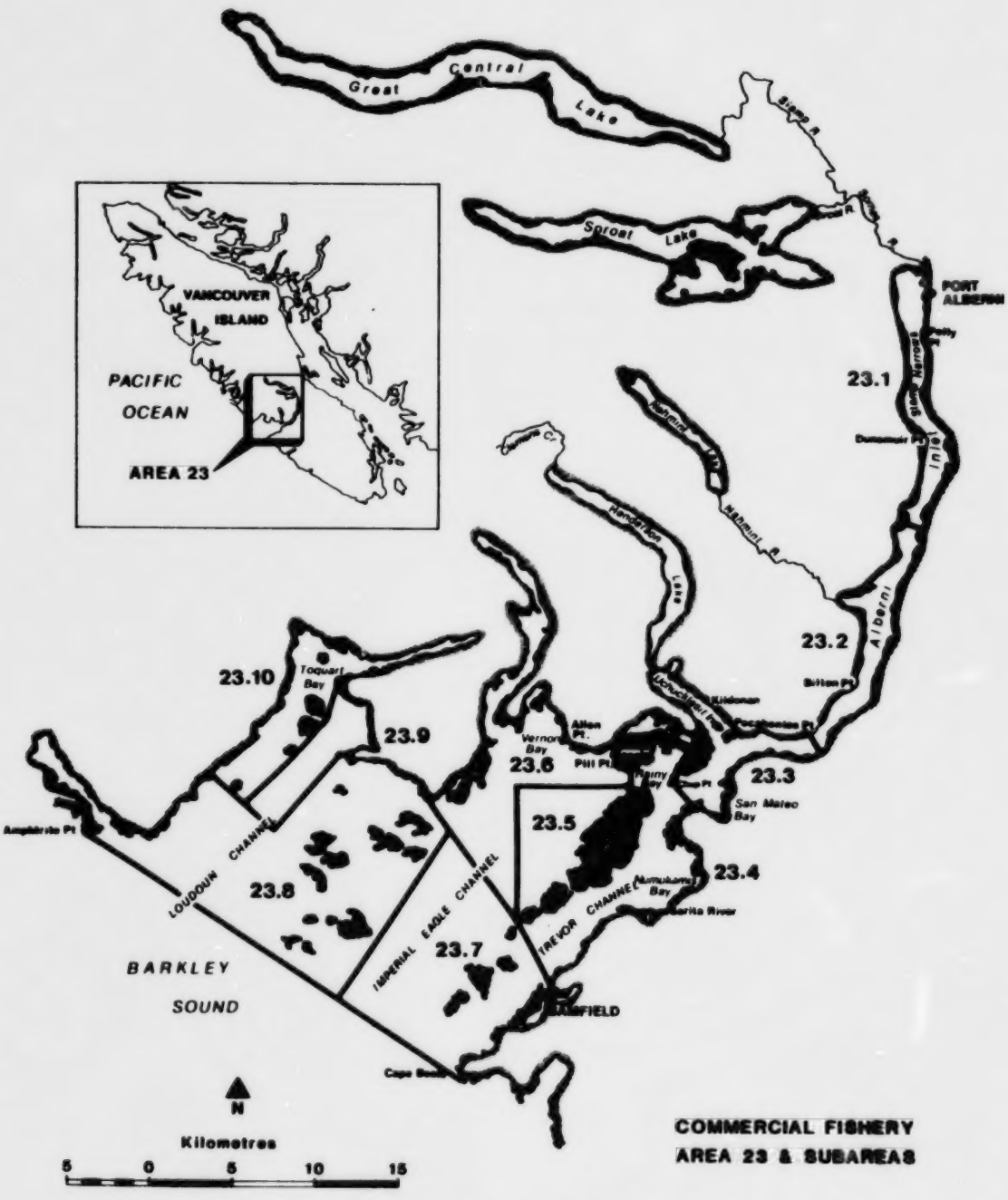

Fig. 1. Statistical Area 23, Barkley Sound and Alberni Inlet.

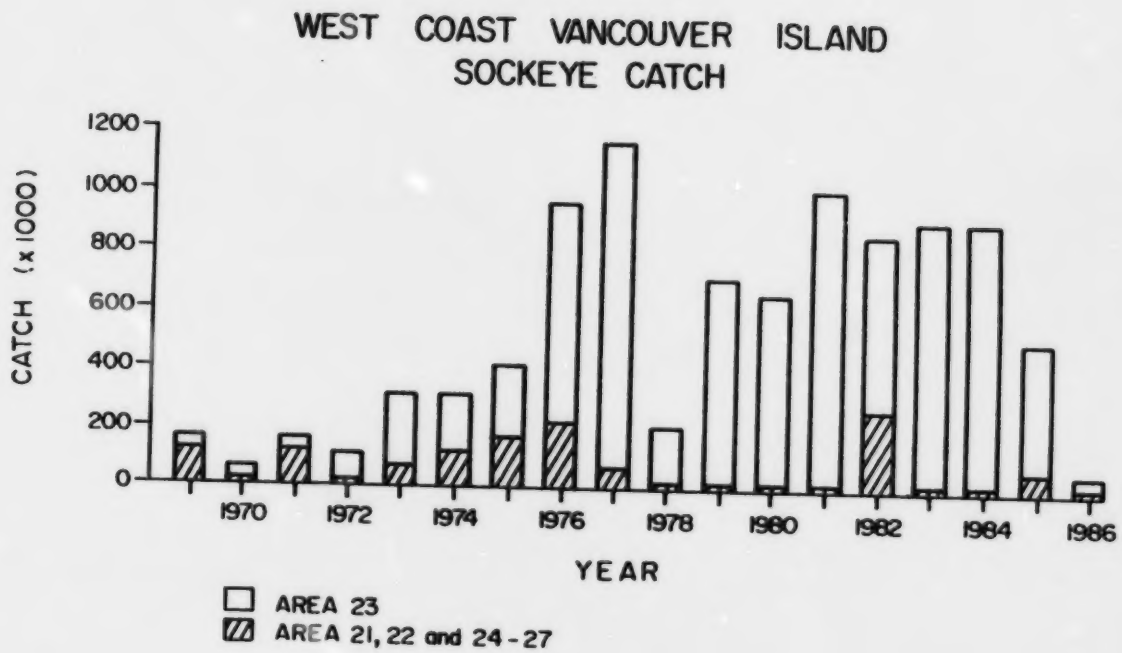

Fig. 2. Catch of sockeye off the west coast of Vancouver Island, 1969-1986, for Areas 21, 22, and 24-27 combined for the Area 23. Data from the DFO Catch Summary Database on the VAX 11/780 mini-computer at the Pacific Biological Station (Wong 1983).

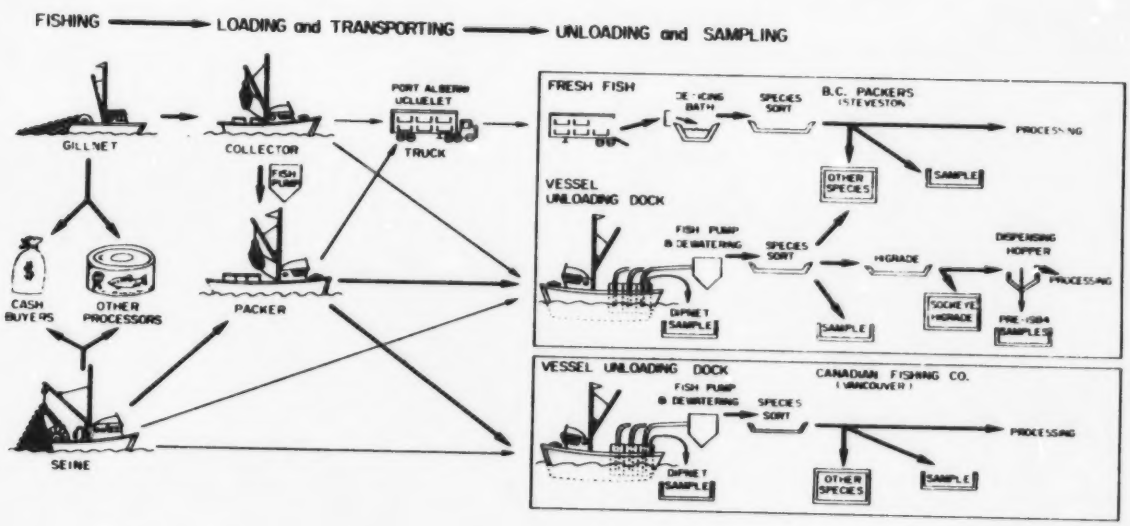

Fig. 3. Processing steps from the catching of sockeye in Area 23 to sampling at the B.C. Packers Ltd. cannery in Steveston and the Canadian Fishing Company cannery in Vancouver.

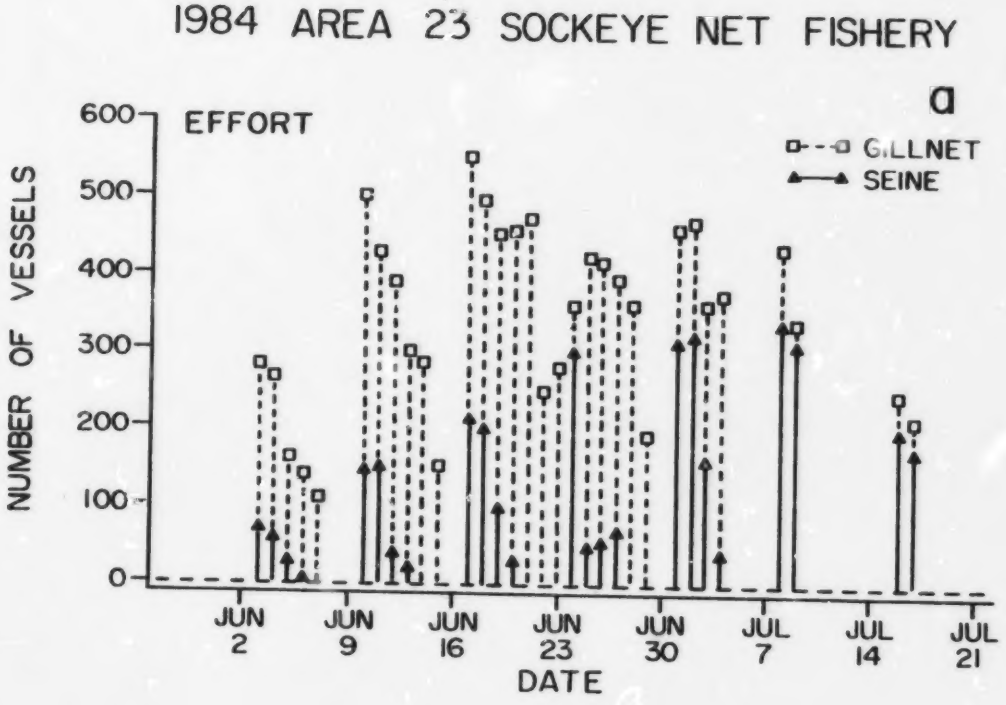

Fig. 4a. Daily vessel counts by gear type during 1984 Area 23 commercial sockeye fishery.

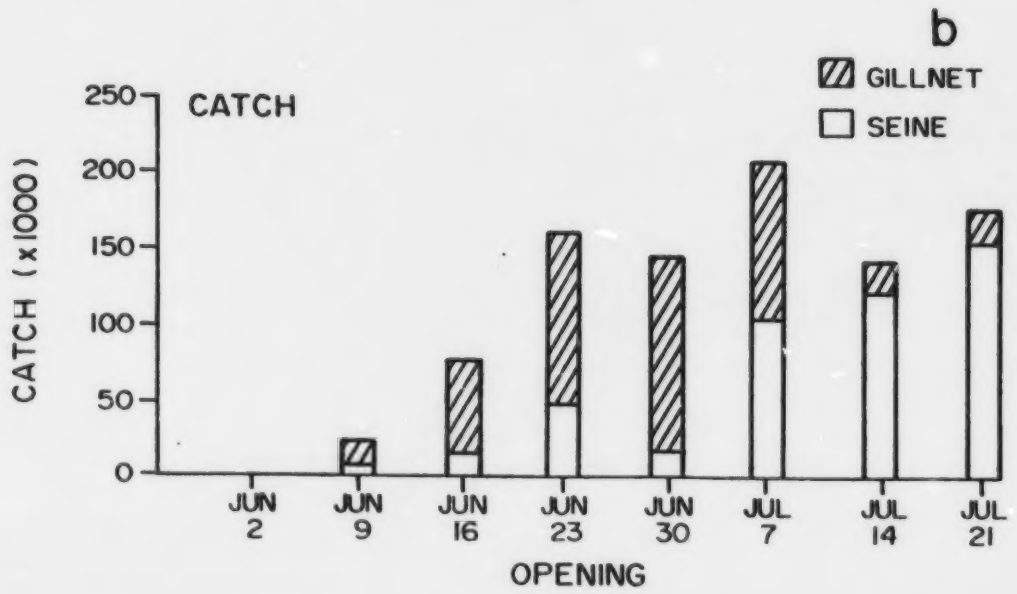

Fig. 4b. Commercial gillnet and seine catch of sockeye by opening during 1984 Area 23 fishery. Catch data are from the DFO Catch Summary Database (Wong 1983).

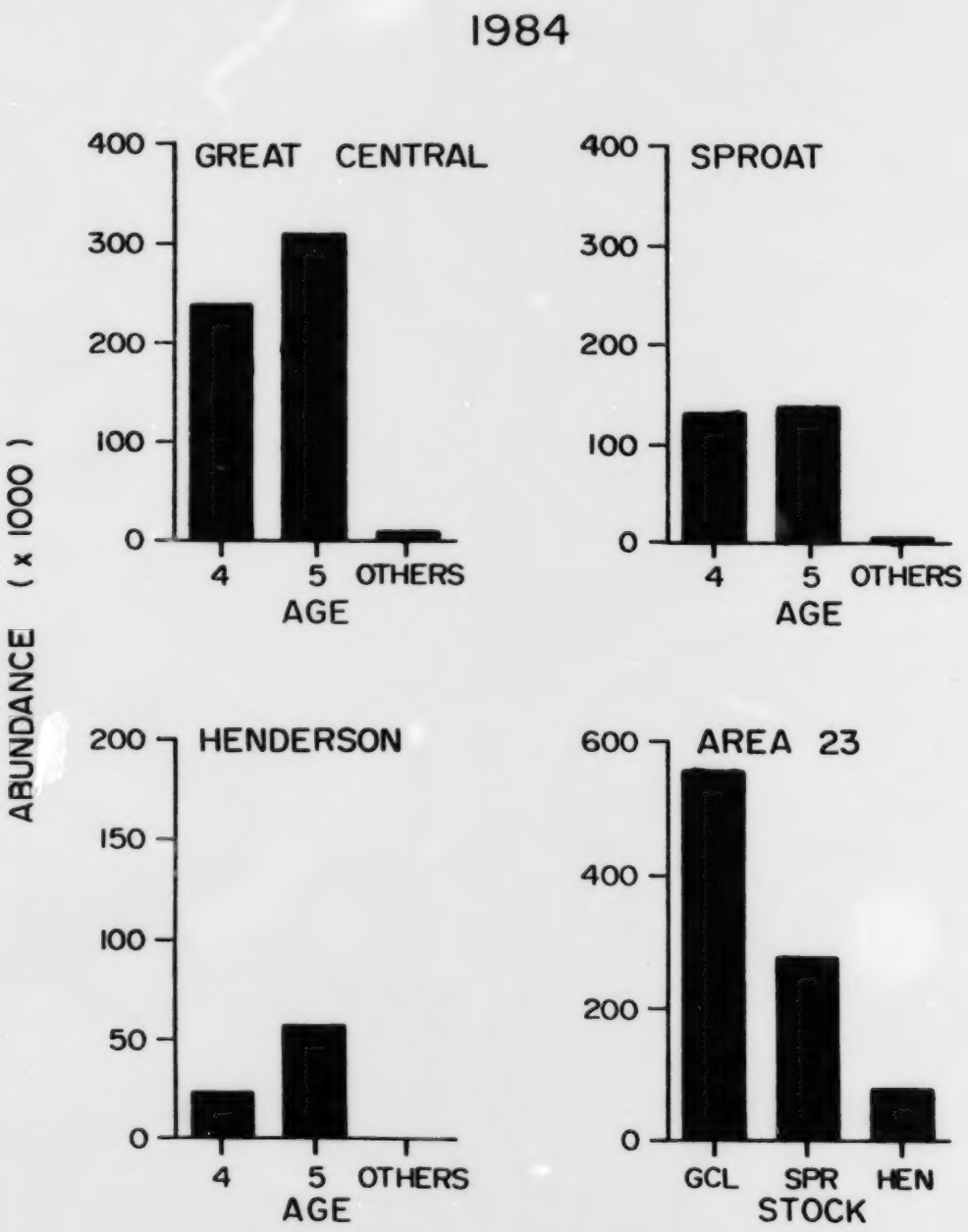

Fig. 5. Age and stock composition of the commercial net catch of sockeye from Area 23 in 1984. Age composition of the catch of (a) Great Central, (b) Sproat, and (c) Henderson sockeye and (d) stock composition of the Area 23 net catch.

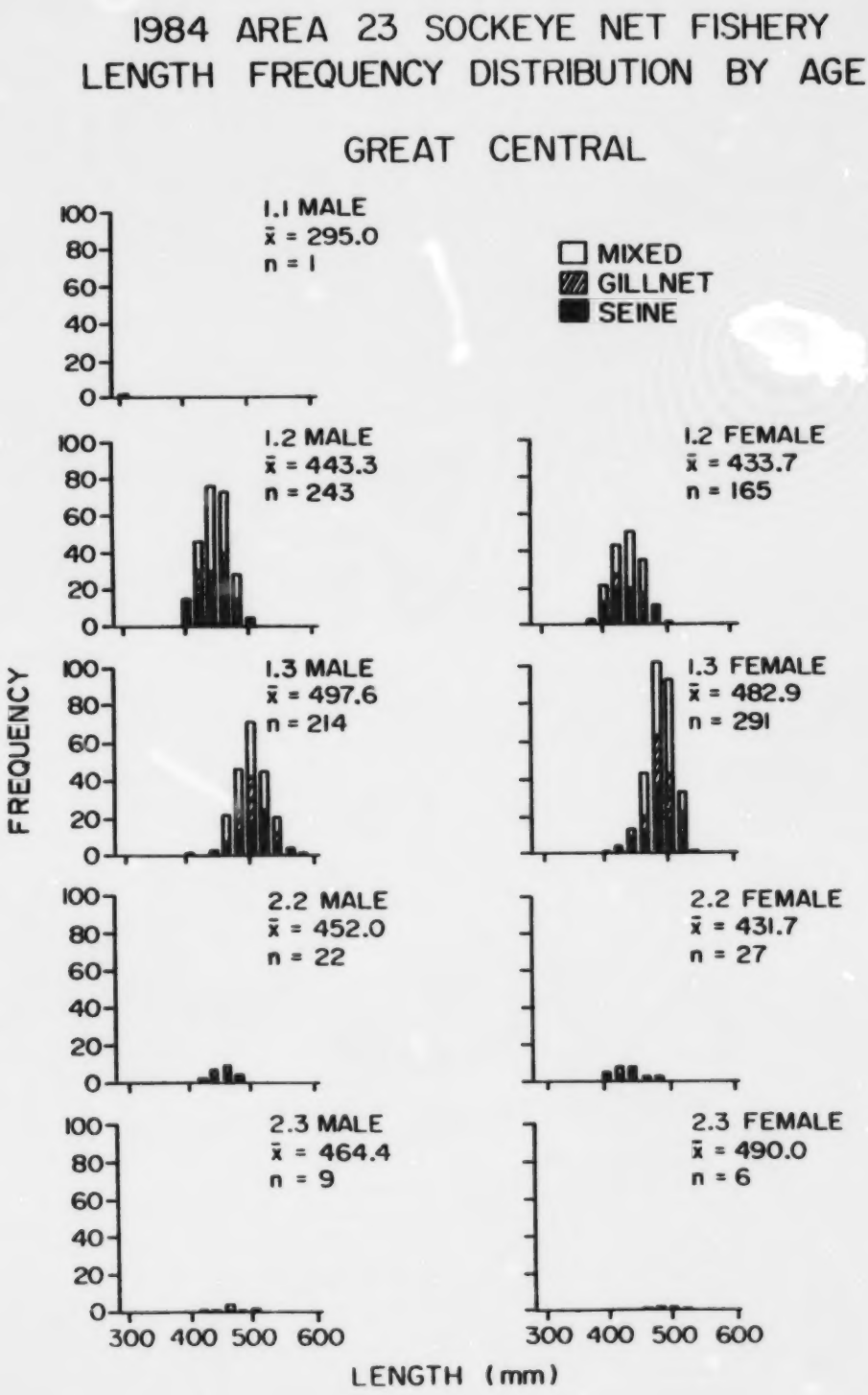

Fig. 6. Length frequency distribution of Great Central sockeye in 1984 Area 23 commercial net catch. $\bar{x}$ is the mean length from pooled samples.

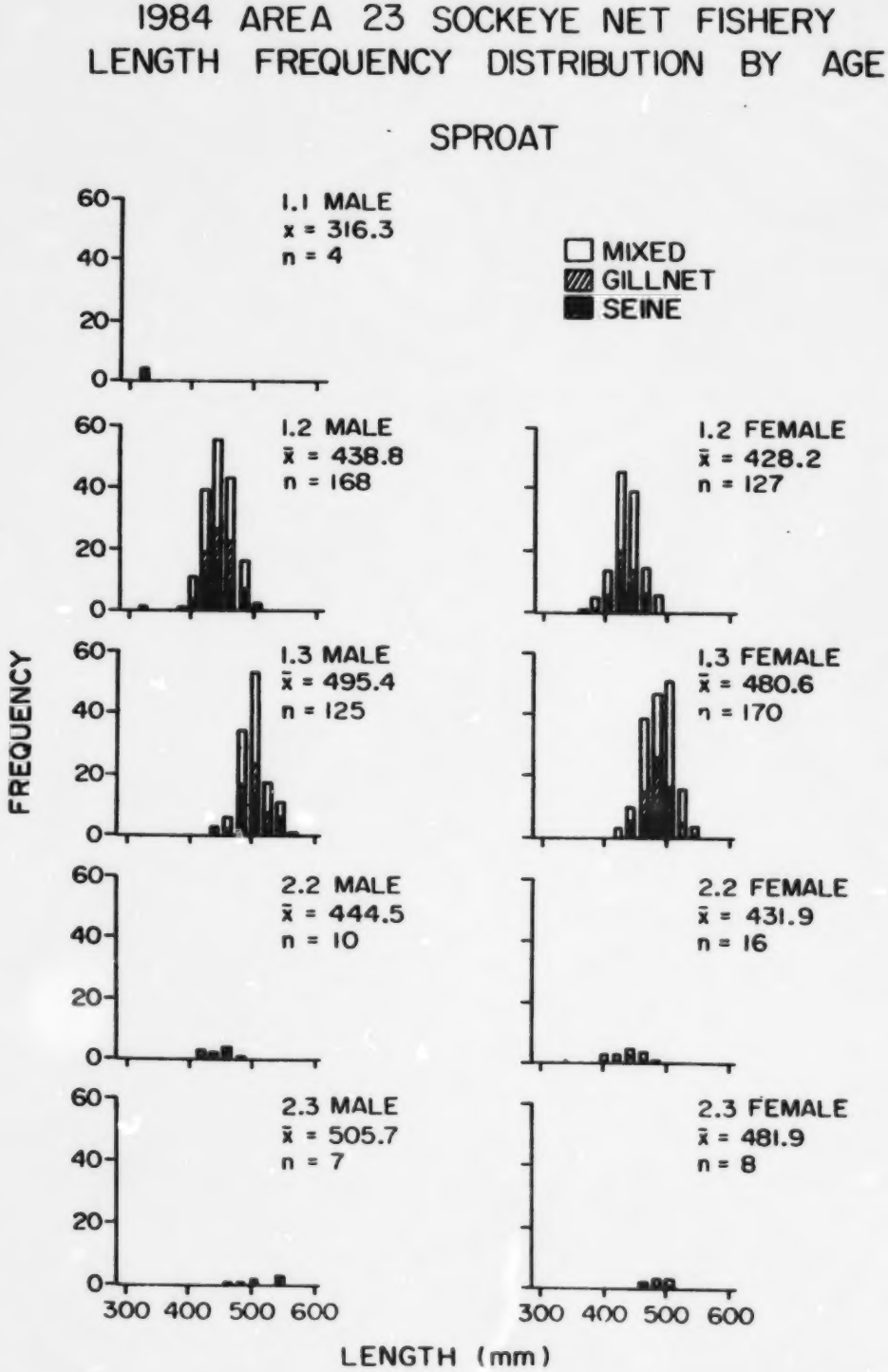

Fig. 7. Length frequency distribution of Sproat sockeye in 1984 Area 23 commercial net catch. $\bar{x}$ is mean length from pooled samples.

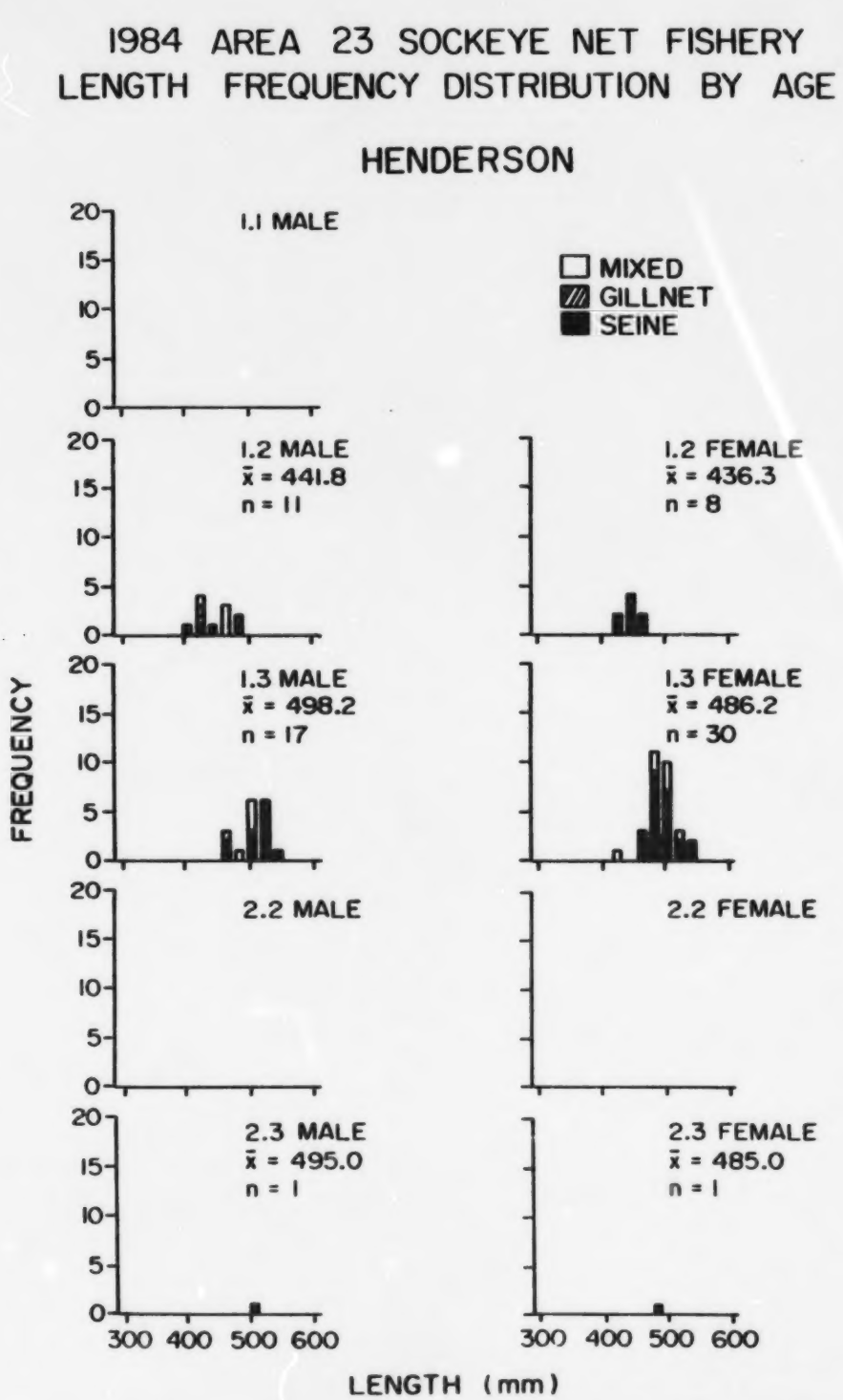

Fig. 8. Length frequency distribution of Henderson sockeye in 1984 Area 23 commercial net catch. $\bar{x}$ is mean length from pooled samples.

Appendix table I. Data records for individual sockeye collected from the commercial net catch from Area 23 in 1984. For scale ages, an "R" in the freshwater portion of the age designation indicates the scale was regenerated and an "R" in the saltwater portion indicates the scale was resorbed. For otolith ages, a "U" indicates the otolith was unreadable and for reconciled ages, a "U" indicates unreconciled scale and otolith ages.

Appendix table I.

Individual Data Records
Area 23 Commercial Fishery

Sample: 1
Date: JUN 6, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	
1	m	465	1.2	1.2	1.2	+			
2	m	495	1.3	1.3	1.3	-			
3	m	475	R.2	1.2	1.2	-			
4	m	490	1.3	1.3	1.3	-			
5	m	475	1.2	1.2	1.2	-			
6	m	480	2.3	2.3	2.3	+			
7	f	415	1.2	1.2	1.2	+			
8	f	440	1.3	1.3	1.3	+			
9	m	470	1.2	1.2	1.2	-			
10	f	475	1.3	1.3	1.3	-			
11	f	450	1.2	1.2	1.2	+			
12	m	445	1.2	1.2	1.2	+			
13	m	500	1.3	1.3	1.3	-			
14	f	445	1.3	1.3	1.3	-			
15	m	520	1.3	2.3	U.3	-			
16	m	395	1.2	1.2	1.2	-			
17	m	495	1.3	1.3	1.3	-			
18	f	470	1.3	1.3	1.3	+			
19	f	465	1.3	1.3	1.3	+			
20	m	480	1.2	1.2	1.2	+			
21	m	470	1.2	1.2	1.2	-			
22	m	465	1.2	1.2	1.2	+			
23	m	460	1.2	1.2	1.2	+			
24	f	435	1.2	1.2	1.2	+			
25	f	480	R.3	1.3	1.3	-			
26	f	505	2.3	2.3	2.3	+			
27	m	490	1.3	1.3	1.3	-			
28	m	420	1.2	1.2	1.2	-			
29	f	495	1.3	1.3	1.3	-			
30	m	460	1.3	1.3	1.3	-			
31	f	515	1.3	1.3	1.3	-			
32	f	485	1.3	1.3	1.3	-			
33	f	475	1.3	1.3	1.3	-			
34	m	485	1.3	1.3	1.3	+			
35	m	435	1.2	1.2	1.2	+			
36	m	480	1.3	1.3	1.3	+			
37	f	490	R.3	1.3	1.3	+			
38	m	410	1.2	1.2	1.2	+			
39	f	460	1.3	1.3	1.3	+			
40	m	470	1.3	1.3	1.3	+			
41	m	475	1.3	1.3	1.3	-			
42	f	450	1.3	1.3	1.3	+			
43	f	465	1.2	1.2	1.2	-			
44	f	460	1.3	1.3	1.3	-			
45	f	495	R.3	1.3	1.3	-			
46	m	490	1.3	1.3	1.3	-			
47	m	480	1.3	1.3	1.3	+			
48	m	430	1.2	1.2	1.2	-			
49	f	445	1.2	1.2	1.2	-			
50	m	445	2.2	2.2	2.2	-			
51	m	430	1.2	1.2	1.2	+			
52	m	455	1.2	1.2	1.2	-			
53	m	485	1.3	1.3	1.3	+			
54	f	500	R.3	1.3	1.3	-			
55	m	485	1.3	1.3	1.3	+			
56	f	490	1.3	1.3	1.3	-			
57	f	505	1.3	1.3	1.3	-			
58	m	415	1.2	1.2	1.2	+			
59	f	455	1.3	1.3	1.3	-			
60	f	460	1.3	2.3	U.3	+			
61	f	495	1.3	1.3	1.3	-			
62	f	480	1.3	1.3	1.3	-			
63	f	490	1.3	1.3	1.3	-			
64	m	440	1.3	1.3	1.3	+			
65	f	495	1.3	1.3	1.3	+			
66	m	440	1.2	1.2	1.2	+			
67	m	445	1.2	1.2	1.2	+			
68	f	380	1.2	1.2	1.2	+			
69	f	450	1.3	1.3	1.3	-			
70	m	440	1.2	1.2	1.2	-			
71	f	445	1.2	1.2	1.2	+			
72	f	375	1.2	1.2	1.2	+			
73	f	480	1.3	1.3	1.3	-			
74	m	435	1.2	1.2	1.2	-			
75	m	500	1.3	1.3	1.3	+			
76	m	450	1.2	1.2	1.2	-			
77	m	460	1.2	1.2	1.2	+			
78	m	465	2.3	2.3	2.3	-			
79	m	480	1.3	1.3	1.3	-			
80	f	505	1.3	1.3	1.3	-			

(Continued)

Appendix table I cont'd

Individual Data Records
Area 23 Commercial Fishery

Sample: 1
Date: JUN 6, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	
81	f	500	1.3	1.3	1.3	+			
82	f	500	1.3	1.3	1.3	+			
83	f	480	1.3	1.3	1.3	-			
84	f	425	1.2	1.2	1.2	+			
85	m	445	1.2	1.2	1.2	-			
86	f	450	1.3	1.3	1.3	+			
87	f	445	1.2	1.2	1.2	-			
88	m	425	1.2	1.2	1.2	+			
89	m	515	1.3	1.3	1.3	+			
90	f	445	1.2	1.2	1.2	-			
91	m	465	1.3	1.3	1.3	-			
92	m	505	1.3	1.3	1.3	+			
93	f	460	1.3	1.3	1.3	-			
94	f	420	1.2	1.2	1.2	+			
95	m	455	1.2	1.2	1.2	-			
96	f	455	1.3	1.3	1.3	-			
97	f	510	1.3	1.3	1.3	-			
98	f	490	1.3	1.3	1.3	-			
99	m	480	1.3	1.3	1.3	-			
100	m	510	1.3	1.3	1.3	-			

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	

Appendix table I cont'd

Individual Data Records
Area 23 Commercial Fishery

Sample: 2
Date: JUN 6, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	
101	m	420	1.2	1.2	1.2	+			
102	m	455	1.2	1.2	1.2	-			
103	m	515	1.3	1.3	1.3	-			
104	m	515	1.3	1.3	1.3	-			
105	m	445	1.2	1.3	1.U	+			
106	f	475	1.2	1.2	1.2	+			
107	f	495	1.3	1.3	1.3	-			
108	m	490	1.3	1.3	1.3	+			
109	m	500	2.3	2.3	2.3	+			
110	m	495	1.3	1.3	1.3	-			
111	f	395	1.2	1.2	1.2	-			
112	m	475	1.3	1.3	1.3	+			
113	m	490	1.3	1.3	1.3	-			
114	f	445	1.2	1.2	1.2	+			
115	m	500	1.3	1.3	1.3	+			
116	m	510	1.3	1.3	1.3	+			
117	m	445	1.2	1.2	1.2	-			
118	m	505	1.3	1.3	1.3	-			
119	f	485	1.3	1.3	1.3	-			
120	f	485	1.3	1.3	1.3	-			
121	m	450	1.3	1.3	1.3	-			
122	f	450	1.2	1.2	1.2	-			
123	m	490	1.3	1.3	1.3	+			
124	f	440	1.3	1.3	1.3	-			
125	f	480	1.3	1.3	1.3	-			
126	m	450	1.2	1.2	1.2	-			
127	m	420	1.2	1.2	1.2	+			
128	m	455	1.3	1.3	1.3	-			
129	f	485	1.3	1.3	1.3	-			
130	m	420	1.2	1.2	1.2	+			
131	m	430	1.2	1.2	1.2	+			
132	m	505	1.3	1.3	1.3	-			
133	f	400	1.2	1.2	1.2	-			
134	f	430	1.2	1.2	1.2	+			
135	f	495	1.3	1.3	1.3	+			
136	f	485	1.3	1.3	1.3	-			
137	m	435	1.2	1.2	1.2	+			
138	m	460	1.3	1.3	1.3	+			
139	m	420	1.2	1.2	1.2	-			
140	f	415	R.3	1.3	1.3	+			
141	m	450	1.2	1.2	1.2	+			
142	m	485	1.2	1.2	1.2	+			
143	f	525	1.3	1.3	1.3	+			
144	f	495	1.3	1.3	1.3	-			
145	f	495	1.3	1.3	1.3	-			
146	m	400	1.2	1.2	1.2	+			
147	f	490	1.3	1.3	1.3	+			
148	m	465	1.3	1.3	1.3	-			
149	f	465	1.3	1.3	1.3	+			
150	m	455	1.3	1.3	1.3	-			
151	m	505	1.3	1.3	1.3	+			
152	f	465	1.2	1.2	1.2	-			
153	f	480	1.3	1.3	1.3	-			
154	f	465	1.3	1.3	1.3	-			
155	m	435	1.2	1.2	1.2	-			
156	m	440	1.3	1.3	1.3	-			
157	f	405	1.2	1.2	1.2	-			
158	f	480	1.3	1.3	1.3	+			
159	f	400	1.2	1.3	1.U	+			
160	m	485	1.3	1.3	1.3	-			
161	f	490	1.3	1.3	1.3	-			
162	f	515	1.3	1.3	1.3	+			
163	f	465	1.2	1.2	1.2	+			
164	f	465	1.3	1.3	1.3	-			
165	f	415	1.2	1.2	1.2	-			
166	m	430	1.2	1.2	1.2	+			
167	m	435	1.2	1.2	1.2	+			
168	f	505	1.3	1.3	1.3	-			
169	f	435	1.3	1.3	1.3	+			
170	m	490	1.3	1.3	1.3	+			
171	m	505	R.3	1.3	1.3	-			
172	f	475	1.3	1.3	1.3	+			
173	f	435	R.R	1.2	1.2	-			
174	m	420	1.2	1.2	1.2	+			
175	f	405	1.3	1.3	1.3	-			
176	m	540	1.3	1.3	1.3	+			
177	f	455	1.3	1.3	1.3	+			
178	m	510	1.3	1.3	1.3	+			
179	f	450	1.2	1.2	1.2	+			
180	m	475	1.3	1.3	1.3	-			

(Continued)

Appendix table I cont'd

Individual Data Records
Area 23 Commercial Fishery

Sample: 2
Date: JUN 6, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	
181	f	430	1.2	1.2	1.2	+			
182	m	400	1.2	1.2	1.2	+			
183	f	420	1.3	1.3	1.3	+			
184	m	465	1.3	1.3	1.3	-			
185	m	445	1.2	1.2	1.2	+			
186	f	430	1.2	1.2	1.2	+			
187	f	485	1.3	1.3	1.3	-			
188	f	485	1.3	1.3	1.3	-			
189	m	495	1.3	1.3	1.3	-			
190	f	495	1.3	1.3	1.3	-			
191	f	425	1.2	1.2	1.2	+			
192	f	485	1.3	1.3	1.3	+			
193	m	455	1.2	1.2	1.2	+			
194	m	445	1.2	1.2	1.2	+			
195	m	425	2.2	2.2	2.2	+			
196	f	500	1.3	1.3	1.3	+			
197	f	420	1.2	1.2	1.2	+			
198	f	495	1.3	1.3	1.3	+			
199	f	425	1.2	1.2	1.2	-			
200	m	495	1.3	1.3	1.3	+			

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	

Appendix table I cont'd

Individual Data Records
Area 23 Commercial Fishery

Sample: 3
Date: JUN 6, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Hennegeuya	Diphyllobothrium	
201	f	465	1.3	2.3	U.3	-			
202	m	465	1.2	1.2	1.2	-			
203	f	470	1.3	1.3	1.3	+			
204	m	500	1.3	1.3	1.3	-			
205	f	490	1.3	1.3	1.3	+			
206	f	480	1.3	1.3	1.3	-			
207	f	470	1.3	1.3	1.3	-			
208	m	505	1.3	1.3	1.3	-			
209	m	480	1.3	1.3	1.3	-			
210	f	500	1.3	1.3	1.3	+			
211	m	495	1.3	1.3	1.3	-			
212	f	480	1.3	1.3	1.3	+			
213	m	460	1.2	1.2	1.2	-			
214	f	505	1.3	1.3	1.3	+			
215	m	440	1.2	1.2	1.2	-			
216	f	415	1.2	1.2	1.2	+			
217	f	385	1.2	1.2	1.2	+			
218	m	405	1.2	1.2	1.2	+			
219	f	510	1.3	1.3	1.3	-			
220	m	490	1.3	1.3	1.3	-			
221	m	435	1.2	1.2	1.2	+			
222	m	460	2.3	2.3	2.3	-			
223	f	450	1.3	1.3	1.3	-			
224	m	465	1.2	1.2	1.2	-			
225	f	465	1.2	1.3	1.U	-			
226	f	475	1.3	1.3	1.3	+			
227	f	430	1.2	1.2	1.2	-			
228	f	455	1.3	1.3	1.3	+			
229	f	485	1.3	1.3	1.3	+			
230	m	475	1.3	1.3	1.3	+			
231	f	445	1.2	1.2	1.2	-			
232	f	520	1.3	1.3	1.3	+			
233	f	485	1.2	1.2	1.2	+			
234	m	515	1.3	1.3	1.3	+			
235	f	455	1.3	1.3	1.3	+			
236	f	510	1.3	1.3	1.3	+			
237	m	495	1.3	1.3	1.3	+			
238	m	445	1.2	1.2	1.2	+			
239	m	450	1.2	1.2	1.2	-			
240	m	460	R.3	1.3	1.3	-			
241	m	420	1.2	1.2	1.2	-			
242	f	485	1.3	1.3	1.3	-			
243	m	425	1.2	1.2	1.2	-			
244	f	505	1.2	1.2	1.2	-			
245	f	425	1.2	1.2	1.2	-			
246	f	465	1.2	1.2	1.2	+			
247	f	500	1.3	1.3	1.3	+			
248	f	505	1.3	1.3	1.3	+			
249	f	435	1.3	1.3	1.3	+			
250	f	465	1.3	1.3	1.3	+			
251	f	455	1.3	1.3	1.3	+			
252	m	475	1.3	1.3	1.3	+			
253	m	485	1.3	1.3	1.3	+			
254	f	465	1.3	1.3	1.3	-			
255	m	425	1.2	1.2	1.2	-			
256	f	450	1.2	1.2	1.2	+			
257	f	405	2.2	2.2	2.2	+			
258	m	515	1.3	1.3	1.3	-			
259	m	435	1.2	1.2	1.2	+			
260	m	500	1.3	1.3	1.3	-			
261	f	505	1.3	1.3	1.3	+			
262	m	475	1.2	1.2	1.2	+			
263	m	500	1.3	1.3	1.3	+			
264	m	495	1.3	1.3	1.3	+			
265	f	440	1.3	1.2	1.U	+			
266	m	415	1.2	1.2	1.2	+			
267	m	500	R.3	1.3	1.3	+			
268	m	410	1.2	1.2	1.2	-			
269	f	410	1.2	1.2	1.2	-			
270	m	495	1.3	1.3	1.3	-			
271	m	425	1.2	1.2	1.2	+			
272	m	525	1.3	1.3	1.3	-			
273	m	470	1.3	1.3	1.3	+			
274	f	485	1.2	1.2	1.2	+			
275	f	515	1.3	1.3	1.3	+			
276	f	445	1.2	1.3	1.U	+			
277	m	520	1.3	1.3	1.3	-			
278	f	500	1.3	1.3	1.3	-			
279	f	450	1.2	1.2	1.2	+			
280	f	495	1.3	1.3	1.3	-			

(Continued)

Appendix table I cont'd

Individual Data Records
Area 23 Commercial Fishery

Sample: 3
Date: JUN 6, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	
281	m	430	1.2	1.2	1.2	-			
282	m	480	1.3	1.3	1.3	-			
283	m	455	1.3	1.3	1.3	+			
284	m	425	R.R	1.2	1.2	-			
285	f	470	1.2	1.2	1.2	-			
286	m	475	1.2	1.2	1.2	+			
287	m	475	1.3	1.3	1.3	+			
288	m	495	1.3	1.3	1.3	+			
289	f	515	1.3	1.3	1.3	-			
290	m	420	1.2	1.2	1.2	+			
291	f	475	R.3	1.3	1.3	+			
292	f	535	1.3	1.3	1.3	+			
293	m	460	1.2	1.2	1.2	+			
294	m	430	1.3	1.2	1.U	-			
295	m	485	1.2	1.2	1.2	-			
296	f	415	1.2	1.2	1.2	+			
297	f	470	1.3	1.3	1.3	+			
298	m	460	1.2	1.2	1.2	+			
299	m	470	1.2	1.2	1.2	-			
300	f	485	1.3	1.3	1.3	+			

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	

Appendix table I cont'd

Individual Data Records
Area 23 Commercial Fishery

Sample: 4
Date: JUN 14, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	
1	m	470	1.3	1.3	1.3	-			
2	m	460	1.2	1.2	1.2	-			
3	f	455	1.3	1.3	1.3	-			
4	f	515	1.3	1.3	1.3	-			
5	f	475	1.3	1.3	1.3	-			
6	m	530	1.3	1.3	1.3	-			
7	m	525	1.3	1.3	1.3	+			
8	m	550	1.3	1.3	1.3	-			
9	m	445	1.2	1.2	1.2	-			
10	f	495	1.3	1.3	1.3	-			
11	f	475	1.3	1.3	1.3	-			
12	f	500	1.3	1.3	1.3	-			
13	f	470	2.2	2.2	2.2	-			
14	f	450	1.3	.	1.3	+			
15	f	515	1.3	1.3	1.3	-			
16	m	535	1.3	1.3	1.3	-			
17	m	455	1.2	.	1.2				
18	f	455	1.2	1.2	1.2	-			
19	f	490	1.3	1.3	1.3	-			
20	m	505	1.3	1.3	1.3	+			
21	m	480	1.3	1.3	1.3	-			
22	m	505	1.3	1.3	1.3	-			
23	f	440	2.2	2.2	2.2	+			
24	m	495	1.3	1.3	1.3	+			
25	f	485	1.3	1.3	1.3	-			
26	m	465	1.2	1.2	1.2	-			
27	m	475	1.3	1.3	1.3	-			
28	m	470	1.2	1.2	1.2	-			
29	m	460	1.3	1.3	1.3	-			
30	m	420	1.2	1.2	1.2	+			
31	f	500	1.3	1.3	1.3	-			
32	f	470	1.3	1.3	1.3	-			
33	f	505	2.3	2.3	2.3	+			
34	f	485	1.3	1.3	1.3	+			
35	f	485	1.3	1.3	1.3	-			
36	m	515	1.3	1.3	1.3	+			
37	f	480	1.3	1.3	1.3	+			
38	m	495	1.3	1.3	1.3	-			
39	f	515	1.3	1.3	1.3	-			
40	f	470	1.3	1.3	1.3	+			
41	f	445	1.2	1.2	1.2	+			
42	f	475	1.3	1.3	1.3	-			
43	f	480	1.3	1.3	1.3	-			
44	f	515	1.3	1.3	1.3	-			
45	f	425	1.2	1.2	1.2	-			
46	m	500	1.3	1.3	1.3	-			
47	m	420	1.2	1.2	1.2	+			
48	f	515	1.3	1.3	1.3	-			
49	f	430	1.2	1.2	1.2	-			
50	m	465	1.3	1.3	1.3	-			
51	m	505	1.3	1.3	1.3	-			
52	m	515	1.3	1.3	1.3	-			
53	f	440	1.2	1.2	1.2	-			
54	f	445	1.3	1.3	1.3	-			
55	f	485	1.3	1.3	1.3	-			
56	f	515	1.3	1.3	1.3	-			
57	f	490	1.3	1.3	1.3	-			
58	m	455	1.2	1.2	1.2	-			
59	f	520	1.3	1.3	1.3	+			
60	m	530	1.3	1.3	1.3	-			
61	m	495	1.3	1.3	1.3	-			
62	f	500	1.3	1.3	1.3	-			
63	m	460	1.2	1.2	1.2	-			
64	f	500	1.3	1.3	1.3	+			
65	m	425	1.2	1.2	1.2	-			
66	m	460	1.2	1.2	1.2	-			
67	f	525	1.3	1.3	1.3	-			
68	m	480	1.2	1.2	1.2	-			
69	f	485	1.3	1.3	1.3	+			
70	m	430	1.2	1.2	1.2	-			
71	m	470	1.3	1.3	1.3	-			
72	m	480	1.3	1.3	1.3	-			
73	m	460	1.3	1.3	1.3	-			
74	m	505	1.3	1.3	1.3	-			
75	m	450	1.2	1.2	1.2	+			
76	m	435	1.2	1.2	1.2	+			
77	f	470	1.3	1.3	1.3	-			
78	m	460	1.2	1.2	1.2	-			
79	f	445	1.3	1.3	1.3	+			
80	m	480	1.3	1.3	1.3	+			

(Continued)

Appendix table I cont'd

Individual Data Records
Area 23 Commercial Fishery

Sample: 4
Date: JUN 14, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Hennegeya	Diphyllobothrium	
81	f	465	1.2	1.2	1.2	-			
82	f	480	1.3	1.3	1.3	-			
83	m	420	1.2	1.2	1.2	+			
84	m	420	1.2	1.2	1.2	-			
85	f	480	1.3	1.3	1.3	+			
86	m	475	1.3	1.3	1.3	+			
87	f	495	1.3	1.3	1.3	-			
88	f	485	1.3	1.3	1.3	+			
89	m	535	1.3	1.3	1.3	-			
90	f	505	1.3	1.3	1.3	+			
91	m	465	1.2	1.2	1.2	-			
92	m	480	1.3	1.3	1.3	-			
93	m	540	1.3	1.3	1.3	-			
94	f	450	1.2	1.2	1.2	-			
95	m	470	1.3	1.3	1.3	+			
96	f	435	1.2	1.2	1.2	+			
97	m	505	1.3	1.3	1.3	-			
98	m	470	1.3	1.3	1.3	-			
99	m	445	1.2	1.2	1.2	+			
100	f	485	1.3	1.3	1.3	+			

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Hennegeya	Diphyllobothrium	

Appendix table I cont'd

Individual Data Records
Area 23 Commercial Fishery

Sample: 5
Date: JUN 19, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	
1	m	505	1.3	1.3	1.3	+			
2	m	435	1.2	1.2	1.2	-			
3	f	400	1.2	1.2	1.2	-			
4	f	460	1.2	1.2	1.2	-			
5	m	540	2.3	2.3	2.3	+			
6	f	485	1.3	1.3	1.3	-			
7	m	450	2.2	2.2	2.2	-			
8	f	490	1.3	1.3	1.3	-			
9	f	495	1.3	1.3	1.3	-			
10	m	450	R.2	1.2	1.2	+			
11	f	515	1.3	1.3	1.3	+			
12	f	500	1.3	1.3	1.3	-			
13	m	440	1.2	1.2	1.2	-			
14	m	505	1.3	1.3	1.3	-			
15	f	490	1.3	1.3	1.3	+			
16	f	500	1.3	1.3	1.3	-			
17	m	540	1.3	1.3	1.3	-			
18	f	430	2.2	2.2	2.2	+			
19	m	465	2.3	2.3	2.3	-			
20	f	525	1.3	1.3	1.3	+			
21	f	485	1.3	1.3	1.3	-			
22	m	440	2.2	2.2	2.2	+			
23	f	480	2.3	2.3	2.3	-			
24	m	440	1.2	1.2	1.2	+			
25	m	425	2.3	2.3	2.3	-			
26	m	455	1.3	1.3	1.3	-			
27	f	515	1.3	1.3	1.3	+			
28	f	445	1.3	1.3	1.3	-			
29	m	455	1.2	1.2	1.2	-			
30	f	440	1.2	1.2	1.2	-			
31	m	440	1.2	1.2	1.2	-			
32	f	450	1.2	1.2	1.2	-			
33	f	460	1.3	1.3	1.3	-			
34	f	465	1.2	1.2	1.2	-			
35	f	425	1.2	1.2	1.2	+			
36	m	450	1.2	1.2	1.2	+			
37	m	495	1.3	1.3	1.3	-			
38	m	420	1.2	1.2	1.2	+			
39	m	465	1.2	1.2	1.2	+			
40	f	455	1.2	1.2	1.2	+			
41	m	475	1.3	1.3	1.3	-			
42	f	510	1.3	1.3	1.3	-			
43	f	460	1.3	1.3	1.3	-			
44	f	500	1.3	1.3	1.3	-			
45	m	455	R.2	1.2	1.2	-			
46	f	470	1.3	1.3	1.3	-			
47	m	530	1.3	1.3	1.3	-			
48	f	500	1.3	1.3	1.3	-			
49	f	420	R.R	1.2	1.2	+			
50	f	460	1.2	1.2	1.2	-			
51	m	450	1.2	2.2	U.2	+			
52	f	430	1.2	1.2	1.2	+			
53	m	425	1.2	1.2	1.2	-			
54	m	445	2.2	2.2	2.2	-			
55	m	500	1.R	1.2	1.2	+			
56	m	460	1.2	1.2	1.2	+			
57	m	430	1.2	1.2	1.2	+			
58	f	425	1.2	1.2	1.2	-			
59	f	520	1.3	1.3	1.3	-			
60	f	430	1.2	1.2	1.2	-			
61	f	480	1.3	1.3	1.3	-			
62	f	495	1.3	1.3	1.3	+			
63	m	505	1.3	1.3	1.3	-			
64	f	495	1.3	1.3	1.3	-			
65	f	445	1.3	1.3	1.3	+			
66	f	460	1.2	1.2	1.2	-			
67	f	505	1.3	1.3	1.3	-			
68	m	420	1.2	1.2	1.2	-			
69	m	500	1.3	1.3	1.3	+			
70	m	425	2.2	2.2	2.2	-			
71	f	500	1.3	1.3	1.3	-			
72	f	460	1.3	1.3	1.3	+			
73	f	485	1.3	1.3	1.3	+			
74	m	495	1.3	1.3	1.3	-			
75	f	445	1.2	1.2	1.2	+			
76	m	500	1.3	1.3	1.3	-			
77	m	500	1.3	1.3	1.3	+			
78	f	405	1.2	1.2	1.2	+			
79	m	505	1.3	1.3	1.3	+			
80	m	455	1.2	1.2	1.2	-			

(Continued)

Appendix table I cont'd

Individual Data Records
Area 23 Commercial Fishery

Sample: 5
Date: JUN 19, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	
81	m	490	1.3	1.3	1.3	-			
82	m	450	1.2	1.2	1.2	+			
83	f	470	1.2	1.2	1.2	-			
84	m	480	1.2	1.2	1.2	+			
85	m	515	1.3	1.3	1.3	-			
86	m	460	1.2	1.2	1.2	-			
87	f	440	1.2	1.2	1.2	+			
88	m	465	1.2	1.2	1.2	-			
89	m	430	1.2	1.2	1.2	-			
90	f	520	1.3	1.3	1.3	+			
91	f	450	1.3	1.3	1.3	+			
92	f	455	1.3	1.3	1.3	-			
93	m	430	1.2	1.2	1.2	+			
94	f	450	1.3	1.3	1.3	+			
95	f	405	1.2	1.2	1.2	-			
96	m	530	2.3	2.3	2.3	+			
97	m	470	1.2	1.2	1.2	+			
98	m	460	1.2	1.2	1.2	-			
99	f	465	1.3	1.3	1.3	-			
100	m	505	1.3	1.3	1.3	+			

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	

Appendix table I cont'd

Individual Data Records
Area 23 Commercial Fishery

Sample: 6
Date: JUN 19, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Hennegeuya	Diphyllobothrium	
1	m	530	1.3	1.3	1.3	+			-
2	m	435	1.2	1.2	1.2	-			-
3	m	500	1.3	1.3	1.3	-			-
4	f	495	1.3	1.3	1.3	+			+
5	f	415	1.2	1.2	1.2	-			-
6	f	445	1.3	1.3	1.3	-			-
7	m	485	1.3	1.3	1.3	+			+
8	m	410	1.2	1.2	1.2	-			-
9	f	420	1.2	2.2	U.2	-			-
10	f	405	1.2	1.2	1.2	+			-
11	m	460	1.2	1.2	1.2	-			-
12	m	515	1.3	1.3	1.3	-			-
13	f	500	1.3	1.3	1.3	+			-
14	f	445	1.2	1.2	1.2	-			-
15	m	515	1.3	1.3	1.3	-			-
16	f	510	1.3	1.3	1.3	+			+
17	f	485	1.3	1.3	1.3	-			-
18	f	455	1.3	1.3	1.3	+			+
19	m	405	1.2	1.2	1.2	-			-
20	f	520	1.3	1.3	1.3	-			-
21	f	465	1.3	1.3	1.3	-			-
22	f	415	2.2	2.2	2.2	-			+
23	m	440	1.2	1.2	1.2	-			+
24	f	445	1.2	1.2	1.2	+			-
25	m	465	1.3	1.3	1.3	-			-
26	m	435	1.2	1.2	1.2	-			-
27	m	425	1.2	1.2	1.2	+			-
28	m	480	1.3	1.3	1.3	-			-
29	f	445	1.2	1.2	1.2	+			+
30	m	435	1.2	1.2	1.2	-			-
31	m	440	1.2	2.2	U.2	+			-
32	f	415	1.2	1.2	1.2	+			-
33	m	470	2.2	2.2	2.2	-			-
34	f	490	1.3	1.3	1.3	+			+
35	f	430	1.2	1.2	1.2	-			+
36	m	450	1.2	1.2	1.2	+			+
37	m	520	1.3	1.3	1.3	-			-
38	f	485	1.3	1.3	1.3	-			-
39	f	455	1.3	1.3	1.3	+			-
40	f	425	1.2	1.2	1.2	+			+
41	f	490	1.3	1.3	1.3	-			-
42	f	410	2.2	2.2	2.2	-			-
43	m	440	1.2	1.2	1.2	-			-
44	f	445	1.2	1.2	1.2	+			-
45	f	435	1.2	1.2	1.2	-			+
46	m	490	1.3	1.3	1.3	-			-
47	m	435	1.2	1.2	1.2	+			-
48	f	465	R.3	1.3	1.3	+			-
49	m	515	1.3	1.3	1.3	-			-
50	m	485	1.3	1.3	1.3	-			+
51	m	450	1.2	1.2	1.2	-			+
52	m	425	1.2	1.2	1.2	+			+
53	m	425	1.2	1.2	1.2	+			-
54	f	520	1.3	1.3	1.3	-			-
55	f	500	1.3	1.3	1.3	-			-
56	f	485	1.2	1.2	1.2	+			+
57	f	475	1.3	1.3	1.3	-			+
58	f	455	1.2	1.2	1.2	-			+
59	m	480	1.3	1.3	1.3	-			-
60	f	480	2.3	2.3	2.3	+			-
61	f	440	1.2	1.2	1.2	-			-
62	m	430	1.2	1.2	1.2	+			+
63	f	515	1.3	1.3	1.3	-			-
64	m	495	R.3	1.3	1.3	-			+
65	m	460	1.2	1.2	1.2	-			-
66	f	505	1.3	1.3	1.3	-			-
67	f	415	1.2	1.2	1.2	+			-
68	m	415	1.2	1.2	1.2	-			-
69	m	505	1.3	2.3	U.3	+			+
70	f	500	1.3	1.3	1.3	+			-
71	f	515	R.3	1.3	1.3	-			-
72	m	530	1.3	1.3	1.3	+			-
73	m	435	1.2	1.2	1.2	-			+
74	m	450	1.2	1.2	1.2	-			-
75	f	420	2.2	2.2	2.2	-			-
76	f	495	1.3	1.3	1.3	+			-
77	m	450	1.3	1.3	1.3	-			-
78	m	450	1.2	1.2	1.2	+			-
79	f	475	1.3	1.3	1.3	-			+
80	m	430	R.2	1.2	1.2	+			+

(Continued)

Appendix table I cont'd

Individual Data Records
Area 23 Commercial Fishery

Sample: 6
Date: JUN 19, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	
81	f	525	1.3	1.3	1.3	+			+
82	f	500	1.3	1.3	1.3	-			-
83	f	490	1.3	1.3	1.3	+			-
84	m	485	1.3	1.3	1.3	-			+
85	f	515	1.3	1.3	1.3	+			-
86	m	390	1.2	.	1.2	+			+
87	m	505	1.3	1.3	1.3	-			-
88	f	415	1.2	2.2	U.2	+			+
89	m	490	1.3	1.3	1.3	+			-
90	m	425	1.2	1.2	1.2	-			-
91	m	490	1.3	1.3	1.3	-			-
92	f	425	R.3	1.3	1.3	+			-
93	f	450	1.3	1.3	1.3	+			-
94	f	505	1.3	1.3	1.3	+			-
95	f	395	1.2	1.2	1.2	-			-
96	f	495	1.3	1.3	1.3	+			-
97	m	400	1.2	1.2	1.2	-			-
98	f	495	1.2	1.2	1.2	-			-
99	f	545	1.3	1.3	1.3	+			-
100	f	415	1.2	1.2	1.2	-			-
101	m	450	1.2	1.2	1.2	-			+
102	m	495	1.3	1.3	1.3	-			+
103	m	420	1.2	1.2	1.2	+			+
104	f	490	1.3	1.3	1.3	+			-
105	f	465	1.3	1.3	1.3	+			-
106	m	460	1.2	1.2	1.2	+			-
107	m	500	1.2	1.2	1.2	-			-
108	f	445	1.3	1.2	1.U	+			-
109	m	505	1.3	1.3	1.3	-			+
110	m	540	1.3	1.3	1.3	-			-
111	f	450	1.3	1.3	1.3	+			-
112	f	490	1.3	1.3	1.3	-			-
113	m	470	1.3	1.3	1.3	-			-
114	f	445	2.2	2.2	2.2	-			-
115	f	430	1.3	1.3	1.3	-			+
116	f	490	1.3	1.3	1.3	-			+
117	m	445	1.2	1.2	1.2	-			-
118	m	520	1.3	1.3	1.3	-			-
119	f	410	1.2	1.2	1.2	+			-
120	m	535	1.3	1.3	1.3	-			-
121	m	460	1.3	1.3	1.3	-			-
122	f	425	1.2	1.2	1.2	+			-
123	f	405	1.2	1.2	1.2	+			+
124	m	475	1.2	1.2	1.2	+			-
125	m	420	1.2	1.2	1.2	-			-
126	m	425	1.2	1.2	1.2	+			-
127	m	540	1.3	1.3	1.3	-			-
128	f	465	1.2	1.2	1.2	-			+
129	f	435	2.2	2.2	2.2	+			+
130	f	450	1.2	1.2	1.2	+			+
131	f	490	1.3	1.3	1.3	-			-
132	m	480	1.2	1.2	1.2	+			-
133	f	450	1.2	1.2	1.2	-			-
134	m	450	1.2	1.2	1.2	-			+
135	m	435	1.2	1.2	1.2	-			+
136	f	485	1.3	1.3	1.3	-			-
137	f	500	1.3	1.3	1.3	-			-
138	m	460	1.2	1.2	1.2	+			-
139	f	405	1.2	1.2	1.2	+			-
140	m	480	1.3	1.3	1.3	-			-
141	m	445	1.2	1.2	1.2	+			+
142	f	500	1.3	1.3	1.3	+			-
143	f	490	1.3	1.3	1.3	+			-
144	m	480	1.3	1.3	1.3	-			+
145	f	460	1.3	1.3	1.3	-			+
146	f	420	1.2	1.2	1.2	+			-
147	f	480	1.3	1.3	1.3	-			-
148	m	425	1.2	1.2	1.2	-			-
149	f	430	1.2	1.2	1.2	-			+
150	m	490	1.3	1.3	1.3	+			-

Appendix table I cont'd

Individual Data Records
Area 23 Commercial Fishery

Sample: 7
Date: JUN 27, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	
1	m	435	1.2	1.2	1.2	+			+
2	m	435	2.2	2.2	2.2	-			+
3	m	485	1.3	1.3	1.3	-			+
4	f	475	1.3	1.3	1.3	+			+
5	f	495	1.3	1.3	1.3	-			+
6	f	530	1.3	1.3	1.3	-			+
7	f	520	1.3	1.3	1.3	-			+
8	m	475	1.3	1.3	1.3	-			+
9	m	525	1.3	1.3	1.3	+			+
10	f	465	1.3	1.3	1.3	-			+
11	f	430	1.3	1.3	1.3	+			+
12	f	510	1.3	1.3	1.3	-			+
13	m	430	1.2	1.2	1.2	-			+
14	m	490	1.3	1.3	1.3	+			+
15	f	480	1.3	1.3	1.3	-			+
16	f	495	1.3	1.3	1.3	-			+
17	m	545	1.3	1.3	1.3	+			+
18	f	420	1.2	1.2	1.2	-			+
19	f	370	.	1.2	1.2	-			+
20	f	495	1.3	1.3	1.3	+			+
21	f	465	1.3	1.3	1.3	-			+
22	m	485	1.3	1.3	1.3	+			+
23	f	465	1.3	1.3	1.3	-			+
24	f	485	1.3	1.3	1.3	-			+
25	f	430	1.2	1.2	1.2	+			+
26	f	450	1.3	1.3	1.3	-			+
27	m	440	1.2	1.2	1.2	+			+
28	m	450	1.2	1.2	1.2	+			+
29	m	480	1.3	1.3	1.3	-			+
30	f	490	1.3	1.3	1.3	-			+
31	f	520	1.3	1.3	1.3	-			+
32	m	500	1.3	1.3	1.3	+			+
33	f	495	1.3	1.3	1.3	+			+
34	f	495	1.3	1.3	1.3	-			+
35	m	435	1.2	1.2	1.2	-			+
36	f	425	1.2	1.2	1.2	+			+
37	m	495	R.3	1.3	1.3	+			+
38	f	440	1.2	1.2	1.2	-			+
39	m	460	1.2	1.2	1.2	-			+
40	m	475	1.3	1.3	1.3	-			+
41	m	440	1.2	1.2	1.2	-			+
42	m	440	1.2	1.2	1.2	-			+
43	m	515	.	1.3	1.3	-			-
44	m	430	1.2	1.2	1.2	-			+
45	f	480	1.3	1.3	1.3	-			+
46	m	410	1.2	1.2	1.2	-			+
47	f	480	1.3	1.3	1.3	+			+
48	m	445	1.2	1.2	1.2	-			+
49	m	450	2.3	2.3	2.3	+			+
50	f	480	1.3	1.3	1.3	+			+
51	m	510	1.3	1.3	1.3	+			+
52	f	440	1.2	1.2	1.2	+			+
53	m	425	2.2	2.2	2.2	+			+
54	f	475	1.3	1.3	1.3	-			+
55	m	460	2.3	2.3	2.3	-			+
56	f	505	1.3	1.3	1.3	-			+
57	m	395	1.2	1.2	1.2	+			+
58	f	420	1.2	1.2	1.2	-			+
59	f	400	1.2	1.2	1.2	+			+
60	f	430	1.2	1.2	1.2	-			+
61	f	455	1.2	1.2	1.2	-			+
62	f	480	1.3	1.3	1.3	+			+
63	f	490	1.3	1.3	1.3	-			+
64	m	450	R.2	1.2	1.2	+			+
65	m	405	1.2	1.2	1.2	+			+
66	m	460	1.2	1.3	1.U	+			+
67	m	475	1.2	1.2	1.2	-			-
68	m	420	1.2	1.2	1.2	-			+
69	m	430	1.2	1.2	1.2	-			+
70	f	450	1.3	1.3	1.3	+			+
71	m	440	1.2	1.2	1.2	-			+
72	f	460	1.3	1.3	1.3	+			+
73	m	405	1.2	1.2	1.2	+			+
74	m	425	1.2	1.3	1.U	+			+
75	f	495	1.3	1.3	1.3	-			+
76	m	460	1.2	1.2	1.2	-			+
77	f	415	.	1.2	1.2	-			-
78	f	510	1.3	1.3	1.3	+			+
79	m	440	1.2	1.2	1.2	-			+
80	m	495	1.3	1.3	1.3	+			+

(Continued)

Appendix table I cont'd

Individual Data Records
Area 23 Commercial Fishery

Sample: 7
Date: JUN 27, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	
81	f	400	.	1.2	1.2	+			-
82	f	500	1.3	1.3	1.3	-			+
83	f	430	.	1.2	1.2	-			+
84	m	435	1.2	1.2	1.2	+			+
85	f	490	1.3	1.3	1.3	-			+
86	f	530	1.3	1.3	1.3	+			+
87	f	450	1.2	1.2	1.2	+			+
88	m	495	1.3	1.3	1.3	+			+
89	m	430	1.2	1.2	1.2	+			+
90	f	415	1.2	1.2	1.2	+			+
91	f	400	.	1.2	1.2	-			+
92	m	525	1.3	1.3	1.3	-			+
93	m	460	1.2	1.2	1.2	-			+
94	f	465	1.3	1.3	1.3	+			+
95	f	380	.	1.2	1.2	+			+
96	f	460	1.2	1.2	1.2	-			+
97	f	435	2.2	2.2	2.2	-			+
98	f	450	1.2	1.2	1.2	-			+
99	f	395	.	1.2	1.2	+			-
100	m	430	1.2	1.2	1.2	-			+

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	

Appendix table I cont'd

Individual Data Records
Area 23 Commercial Fishery

Sample: 8
Date: JUN 27, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Oto-lith	Recon-ciled	Myxo-bolus	Henn-eguya	Diphylo-bothrium	
1	m	530	1.3	1.3	1.3	+			+
2	m	440	1.2	1.2	1.2	+			+
3	m	485	2.3	1.3	U.3	-			+
4	m	515	1.3	1.3	1.3	-			+
5	m	455	2.2	2.2	2.2	+			+
6	f	460	1.3	1.3	1.3	-			+
7	f	475	1.3	1.3	1.3	-			+
8	f	460	1.2	1.2	1.2	-			+
9	f	485	1.3	1.3	1.3	-			+
10	m	515	1.3	1.3	1.3	+			+
11	f	430	1.2	1.2	1.2	-			+
12	m	475	1.3	1.3	1.3	-			+
13	m	465	1.2	1.2	1.2	-			+
14	m	505	1.3	1.3	1.3	+			+
15	m	445	1.2	1.2	1.2	-			+
16	f	505	2.3	2.3	2.3	+			+
17	f	475	1.2	1.2	1.2	+			+
18	f	455	1.2	1.2	1.2	-			+
19	m	465	1.2	1.2	1.2	+			+
20	f	420	2.2	2.2	2.2	+			+
21	f	435	1.2	1.2	1.2	+			+
22	m	535	1.3	1.3	1.3	-			+
23	f	470	1.3	1.3	1.3	-			+
24	f	450	1.3	1.3	1.3	-			+
25	f	445	1.2	1.2	1.2	-			+
26	f	445	1.2	1.2	1.2	-			+
27	m	450	1.2	1.2	1.2	-			+
28	f	465	2.2	2.2	2.2	+			+
29	f	460	1.2	1.2	1.2	-			+
30	f	455	1.2	1.2	1.2	-			+
31	m	430	1.2	1.2	1.2	-			+
32	f	430	1.2	1.2	1.2	-			+
33	m	495	1.3	1.3	1.3	+			+
34	f	475	1.3	1.3	1.3	-			+
35	f	445	1.2	1.2	1.2	+			+
36	f	470	2.2	2.2	2.2	+			+
37	f	405	1.2	1.2	1.2	-			-
38	m	440	1.2	1.2	1.2	-			+
39	m	485	1.3	1.3	1.3	-			+
40	f	440	1.2	1.2	1.2	+			+
41	f	500	1.3	1.3	1.3	-			+
42	m	465	1.3	1.3	1.3	-			+
43	m	535	1.3	1.3	1.3	-			+
44	m	460	1.3	1.3	1.3	-			+
45	f	465	1.3	1.3	1.3	-			+
46	m	430	1.2	1.2	1.2	-			+
47	m	460	2.2	2.2	2.2	-			+
48	m	445	1.2	1.2	1.2	+			+
49	m	475	1.3	1.3	1.3	-			-
50	f	435	1.2	1.2	1.2	-			+
51	m	485	1.2	1.2	1.2	+			+
52	m	450	1.2	1.2	1.2	-			+
53	m	430	1.2	1.2	1.2	-			+
54	m	470	2.2	2.2	2.2	+			+
55	m	545	1.3	1.3	1.3	-			-
56	m	450	1.2	1.2	1.2	-			+
57	f	435	1.2	1.2	1.2	-			+
58	m	430	1.2	1.2	1.2	-			+
59	m	490	1.3	1.3	1.3	-			+
60	f	420	1.2	1.2	1.2	-			+
61	f	460	1.3	1.3	1.3	+			+
62	m	450	1.2	1.2	1.2	-			+
63	f	475	1.3	1.3	1.3	+			+
64	f	495	1.3	1.3	1.3	-			+
65	m	460	1.2	1.2	1.2	+			+
66	m	480	1.3	1.3	1.3	+			+
67	m	555	1.3	1.3	1.3	-			+
68	m	440	1.2	1.2	1.2	+			+
69	m	440	1.2	1.2	1.2	-			+
70	m	435	1.2	1.2	1.2	-			+
71	m	475	1.3	1.3	1.3	+			+
72	m	465	1.2	1.2	1.2	-			+
73	m	495	1.3	1.3	1.3	+			+
74	m	535	1.3	1.3	1.3	-			+
75	f	495	1.3	1.3	1.3	-			+
76	m	485	1.2	1.2	1.2	-			+
77	m	460	2.2	2.2	2.2	-			+
78	f	450	2.2	2.2	2.2	+			+
79	f	485	1.3	1.3	1.3	-			+
80	m	405	1.2	1.2	1.2	-			+

(Continued)

Appendix table I cont'd

Individual Data Records
Area 23 Commercial Fishery

Sample: 8
Date: JUN 27, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	
81	f	475	1.3	1.3	1.3	-			+
82	f	440	1.3	1.3	1.3	+			+
83	m	500	1.2	1.2	1.2	-			+
84	m	525	1.3	1.3	1.3	-			-
85	f	465	1.3	1.3	1.3	+			+
86	m	445	1.2	1.2	1.2	-			+
87	m	500	1.3	1.3	1.3	-			+
88	m	495	1.3	1.3	1.3	+			+
89	m	440	1.2	1.2	1.2	-			+
90	m	425	1.2	1.2	1.2	+			+
91	m	435	1.2	1.2	1.2	-			+
92	m	455	1.3	1.3	1.3	+			+
93	f	485	1.3	1.3	1.3	-			+
94	f	475	1.3	1.3	1.3	+			+
95	f	460	1.3	1.3	1.3	+			+
96	f	390	1.2	1.2	1.2	-			+
97	m	430	1.2	1.2	1.2	-			+
98	f	435	1.2	1.2	1.2	-			+
99	m	470	1.3	1.3	1.3	-			+
100	m	455	1.2	1.2	1.2	-			+

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	

Appendix table I cont'd

Individual Data Records
Area 23 Commercial Fishery

Sample: 9
Date: JUL 3, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	
1	m	495	1.3	1.3	1.3	+	-	0	
2	m	455	1.2	1.2	1.2	+	-	0	
3	f	405	1.2	1.2	1.2	-	-	0	
4	m	485	1.3	1.3	1.3	-	-	2	
5	f	475	1.3	1.3	1.3	-	-	0	
6	m	480	2.2	1.2	U.2	-	-	0	
7	m	485	2.2	2.2	2.2	-	-	4	
8	m	430	1.2	1.2	1.2	+	-	0	
9	f	390	1.2	1.2	1.2	+	-	0	
10	f	425	2.2	2.2	2.2	-	-	0	
11	m	470	1.3	1.3	1.3	-	-	4	
12	f	405	1.2	1.2	1.2	-	-	2	
13	m	480	1.2	1.2	1.2	+	-	0	
14	f	485	1.3	1.3	1.3	-	-	0	
15	f	400	2.2	2.2	2.2	-	-	4	
16	m	470	1.3	1.3	1.3	-	-	2	
17	m	440	1.2	1.2	1.2	-	-	0	
18	f	420	1.3	1.3	1.3	-	-	0	
19	f	480	1.3	1.3	1.3	+	-	0	
20	f	445	1.3	1.3	1.3	-	-	3	
21	f	475	1.3	1.3	1.3	-	-	1	
22	f	415	1.2	1.2	1.2	-	-	4	
23	m	505	1.3	1.3	1.3	-	-	4	
24	f	415	1.2	1.2	1.2	-	-	6	
25	m	485	1.3	1.3	1.3	-	-	6	
26	m	400	1.2	1.2	1.2	-	-	1	
27	f	445	1.2	1.2	1.2	-	-	3	
28	f	450	1.2	1.2	1.2	-	-	0	
29	m	440	1.3	1.3	1.3	+	-	0	
30	f	455	1.2	2.2	U.2	+	-	0	
31	f	450	1.2	1.2	1.2	+	+	1	
32	m	505	1.3	1.3	1.3	+	-	0	
33	f	420	1.2	1.2	1.2	-	-	3	
34	m	510	1.3	1.3	1.3	-	-	4	
35	m	425	1.2	1.2	1.2	-	-	0	
36	m	425	1.2	1.2	1.2	-	-	0	
37	m	490	1.3	1.3	1.3	-	-	4	
38	f	415	1.2	1.2	1.2	+	-	0	
39	f	440	1.3	1.3	1.3	-	-	1	
40	m	510	1.3	1.3	1.3	-	-	1	
41	f	445	1.3	1.3	1.3	-	-	1	
42	m	455	2.2	2.2	2.2	-	-	2	
43	f	470	1.3	1.3	1.3	-	-	12	
44	f	455	1.2	1.2	1.2	-	-	0	
45	f	500	1.3	1.3	1.3	-	-	4	
46	f	430	2.2	2.2	2.2	-	-	0	
47	m	495	1.3	1.3	1.3	-	-	3	
48	f	395	2.2	2.2	2.2	-	-	3	
49	f	440	1.3	1.2	1.U	-	-	1	
50	m	500	1.3	1.3	1.3	-	-	2	
51	f	445	1.3	1.3	1.3	-	-	1	
52	f	510	1.3	1.3	1.3	-	-	2	
53	m	320	1.1	1.1	1.1	+	-	0	
54	f	510	1.3	1.3	1.3	-	-	2	
55	m	485	1.3	1.3	1.3	-	-	1	
56	m	410	1.2	1.2	1.2	+	-	0	
57	f	480	1.3	1.3	1.3	-	-	4	
58	m	545	2.3	2.3	2.3	+	-	0	
59	f	460	1.3	1.3	1.3	+	-	0	
60	f	395	1.2	1.2	1.2	-	-	4	
61	m	445	1.2	1.2	1.2	-	-	0	
62	f	415	1.2	1.2	1.2	+	-	0	
63	m	425	1.2	1.2	1.2	-	-	0	
64	m	435	1.2	1.2	1.2	+	-	0	
65	f	455	1.3	1.3	1.3	-	-	0	
66	f	470	1.3	1.3	1.3	+	-	3	
67	f	375	R.2	1.2	R.2	-	-	1	
68	m	415	1.2	1.2	1.2	+	-	0	
69	f	490	1.3	1.3	1.3	+	-	1	
70	m	415	1.2	1.2	1.2	+	-	2	
71	f	430	1.2	1.2	1.2	+	-	0	
72	m	435	1.2	1.2	1.2	-	-	2	
73	f	430	1.3	1.2	1.U	-	-	0	
74	f	500	1.3	1.3	1.3	-	-	3	
75	f	435	1.2	1.2	1.2	-	-	0	
76	f	430	1.2	1.2	1.2	-	-	1	
77	m	550	1.3	1.3	1.3	+	-	1	
78	m	510	1.3	1.3	1.3	+	+	1	
79	f	455	1.3	1.3	1.3	-	-	1	
80	f	430	1.2	1.2	1.2	-	-	0	

(Continued)

Appendix table I cont'd

Individual Data Records
Area 23 Commercial Fishery

Sample: 9
Date: JUL 3, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	
81	m	425	1.2	1.2	1.2	+	-	0	
82	m	315	1.1	1.1	1.1	+	-	0	
83	m	470	1.3	1.3	1.3	-	-	5	
84	m	405	2.2	1.2	U.2	-	-	0	
85	m	430	1.2	1.2	1.2	-	-	1	
86	m	390	1.2	1.2	1.2	+	-	0	
87	m	400	1.2	1.2	1.2	-	-	3	
88	f	420	1.2	1.2	1.2	-	-	4	
89	f	480	1.3	1.3	1.3	-	-	8	
90	m	490	1.3	1.3	1.3	-	-	7	
91	m	415	1.2	1.2	1.2	-	-	1	
92	f	470	1.3	1.3	1.3	-	-	0	
93	m	515	R.3	1.3	R.3	-	-	2	
94	f	490	1.3	1.3	1.3	+	-	0	
95	m	490	1.3	1.3	1.3	-	-	1	
96	f	405	R.2	1.2	R.2	+	-	0	
97	m	545	1.3	1.3	1.3	+	-	0	
98	f	470	1.3	1.3	1.3	+	-	0	
99	m	505	1.3	1.3	1.3	-	-	2	
100	f	510	1.3	1.3	1.3	-	-	0	
101	f	470	1.3	1.3	1.3	-	-	1	
102	m	465	2.2	2.2	2.2	+	-	0	
103	f	460	1.3	1.3	1.3	-	-	0	
104	f	460	1.3	1.3	1.3	-	-	2	

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	

Appendix table I cont'd

Individual Data Records
Area 23 Commercial Fishery

Sample: 10
Date: JUL 4, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	
1	f	425	1.2	1.2	1.2	-	-	0	
2	f	505	1.3	1.3	1.3	+	-	0	
3	f	485	1.3	1.3	1.3	-	-	0	
4	f	485	1.3	1.3	1.3	-	-	5	
5	m	435	1.2	1.2	1.2	-	-	0	
6	f	465	1.2	1.2	1.2	-	-	3	
7	m	490	1.3	1.3	1.3	-	-	2	
8	m	465	1.2	1.2	1.2	+	-	1	
9	f	395	1.2	1.2	1.2	-	-	0	
10	m	465	1.2	1.2	1.2	+	-	0	
11	f	470	1.3	1.3	1.3	-	-	2	
12	m	445	1.2	1.2	1.2	-	-	2	
13	f	420	R.2	1.2	R.2	-	-	3	
14	f	500	1.3	1.3	1.3	+	-	0	
15	f	430	1.2	1.2	1.2	-	-	2	
16	f	485	1.3	1.3	1.3	-	-	0	
17	m	435	1.3	1.3	1.3	+	-	0	
18	f	425	1.3	1.3	1.3	-	-	4	
19	m	430	1.2	1.2	1.2	+	-	0	
20	f	470	1.3	1.3	1.3	+	-	2	
21	f	480	1.3	1.3	1.3	-	-	4	
22	m	460	1.2	1.2	1.2	-	-	0	
23	f	480	1.3	1.3	1.3	+	-	0	
24	f	445	1.2	1.2	1.2	-	-	0	
25	m	425	1.2	1.2	1.2	+	-	0	
26	m	460	1.2	1.2	1.2	+	-	0	
27	f	480	1.2	1.2	1.2	-	-	0	
28	m	455	1.2	1.2	1.2	-	-	3	
29	f	450	1.2	1.2	1.2	-	-	0	
30	f	495	1.3	1.3	1.3	-	-	0	
31	m	445	1.2	1.2	1.2	+	-	0	
32	m	440	1.2	1.2	1.2	-	-	2	
33	f	430	1.2	1.2	1.2	-	-	1	
34	m	415	1.2	1.2	1.2	+	-	0	
35	m	420	1.2	1.2	1.2	-	-	1	
36	m	490	1.3	1.3	1.3	-	-	6	
37	m	520	1.3	1.3	1.3	+	-	1	
38	f	475	R.3	1.3	R.3	-	-	1	
39	m	500	1.2	1.2	1.2	-	-	0	
40	m	520	1.3	1.3	1.3	-	-	7	
41	m	440	1.2	1.2	1.2	-	-	0	
42	m	440	1.2	1.2	1.2	-	-	0	
43	m	505	1.3	1.3	1.3	-	-	2	
44	f	415	1.2	1.2	1.2	+	-	1	
45	f	430	2.2	2.2	2.2	-	-	1	
46	f	470	1.3	1.3	1.3	+	-	0	
47	f	440	1.2	1.2	1.2	-	-	2	
48	m	430	1.2	1.2	1.2	-	-	3	
49	f	470	1.3	1.3	1.3	-	-	9	
50	f	515	1.3	1.3	1.3	-	-	3	
51	m	480	1.2	1.2	1.2	-	-	0	
52	m	425	1.2	1.2	1.2	-	-	2	
53	m	480	1.3	1.3	1.3	-	-	3	
54	m	500	1.3	1.3	1.3	-	-	4	
55	f	450	2.2	2.2	2.2	-	-	0	
56	m	480	1.2	1.2	1.2	-	-	0	
57	m	410	1.2	1.2	1.2	-	-	0	
58	m	465	1.3	1.3	1.3	+	-	0	
59	f	425	1.2	1.2	1.2	-	-	2	
60	m	420	1.2	1.2	1.2	-	-	0	
61	m	425	1.2	1.2	1.2	-	-	0	
62	m	490	1.3	1.3	1.3	+	-	0	
63	m	460	1.2	1.2	1.2	+	-	3	
64	m	415	R.R	1.2	R.R	-	-	1	
65	m	470	2.2	2.2	2.2	-	-	1	
66	f	465	1.3	1.3	1.3	+	-	0	
67	m	415	1.2	1.2	1.2	-	-	0	
68	f	490	1.3	1.3	1.3	-	-	3	
69	f	425	1.2	1.2	1.2	+	-	0	
70	f	450	1.3	1.3	1.3	+	-	2	
71	f	480	1.3	1.3	1.3	+	-	0	
72	f	470	1.2	1.2	1.2	-	-	0	
73	m	490	1.3	1.3	1.3	+	-	0	
74	m	475	1.3	1.3	1.3	-	-	2	
75	m	515	1.3	1.3	1.3	-	-	2	
76	m	475	1.2	1.2	1.2	-	-	0	
77	f	470	1.3	1.3	1.3	-	-	1	
78	m	525	1.3	1.3	1.3	+	-	3	
79	f	425	1.2	1.2	1.2	+	-	0	
80	f	415	1.2	1.2	1.2	-	-	0	

(Continued)

Appendix table I cont'd

Individual Data Records
Area 23 Commercial Fishery

Sample: 10
Date: JUL 4, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	
81	m	455	1.2	1.2	1.2	-	-	0	
82	m	460	1.2	1.2	1.2	-	-	0	
83	m	510	1.3	1.3	1.3	-	-	7	
84	m	500	1.3	1.3	1.3	-	-	3	
85	m	410	1.2	1.2	1.2	-	-	1	
86	m	465	1.2	1.2	1.2	-	-	0	
87	m	475	1.2	1.2	1.2	-	-	0	
88	m	495	1.3	1.3	1.3	-	-	3	
89	f	470	1.3	1.3	1.3	+	-	0	
90	f	470	1.3	1.3	1.3	+	-	3	
91	f	435	1.2	1.2	1.2	+	-	1	
92	f	470	1.3	1.3	1.3	-	-	2	
93	f	460	1.3	1.3	1.3	+	-	0	
94	f	430	1.2	1.2	1.2	-	-	0	
95	m	495	1.3	1.3	1.3	+	-	1	
96	f	470	1.3	1.3	1.3	+	+	1	
97	f	460	1.3	1.3	1.3	-	-	2	
98	m	460	1.2	1.2	1.2	+	-	2	
99	m	495	1.3	1.3	1.3	-	-	1	
100	f	390	1.2	1.2	1.2	-	-	1	

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	

Appendix table I cont'd

Individual Data Records
Area 23 Commercial Fishery

Sample: 11
Date: JUL 4, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Hennegyua	Diphyllobothrium	
1	f	420	1.2	1.2	1.2	+			-
2	m	500	1.3	1.3	1.3	-			-
3	m	410	R.2	1.2	1.2	+			-
4	m	485	1.3	1.3	1.3	+			-
5	f	415	1.2	1.2	1.2	-			-
6	f	455	1.2	1.2	1.2	+			+
7	m	500	1.3	1.3	1.3	+			-
8	m	455	1.2	1.2	1.2	-			+
9	f	435	1.2	1.2	1.2	+			-
10	f	455	1.3	1.3	1.3	-			-
11	f	420	1.2	1.2	1.2	+			-
12	m	485	1.3	1.3	1.3	-			-
13	f	415	1.2	1.2	1.2	+			+
14	f	475	1.3	1.3	1.3	+			-
15	f	440	1.2	1.2	1.2	-			-
16	f	485	1.3	1.3	1.3	-			-
17	f	465	1.3	1.3	1.3	+			-
18	f	440	1.2	1.2	1.2	+			-
19	f	505	1.3	1.3	1.3	-			+
20	f	395	1.2	1.2	1.2	-			+
21	m	440	1.2	1.2	1.2	+			-
22	f	435	1.2	1.2	1.2	+			+
23	f	435	1.2	1.2	1.2	+			-
24	f	495	1.3	1.3	1.3	+			+
25	m	435	1.2	1.2	1.2	-			+
26	f	440	1.2	1.2	1.2	+			-
27	f	450	1.2	1.3	1.U	+			+
28	m	450	1.2	1.2	1.2	-			-
29	f	470	1.3	1.3	1.3	+			+
30	m	475	1.2	1.2	1.2	+			+
31	f	505	1.3	1.3	1.3	-			-
32	m	520	1.3	1.3	1.3	-			-
33	m	395	1.2	1.2	1.2	-			-
34	f	495	1.3	1.3	1.3	-			-
35	f	495	1.3	1.3	1.3	+			-
36	f	445	1.2	1.2	1.2	-			-
37	m	430	1.2	1.2	1.2	+			+
38	f	420	2.2	2.2	2.2	+			-
39	m	480	1.3	1.3	1.3	-			-
40	m	450	1.2	1.2	1.2	+			+
41	f	500	2.3	2.3	2.3	-			+
42	f	490	1.3	1.3	1.3	-			-
43	f	505	1.3	1.3	1.3	+			-
44	f	455	1.2	1.2	1.2	-			-
45	f	505	1.3	1.3	1.3	-			+
46	f	445	1.2	1.2	1.2	-			-
47	m	545	1.3	1.3	1.3	-			-
48	f	450	1.2	1.2	1.2	-			+
49	m	425	1.2	1.2	1.2	-			+
50	f	460	R.2	1.2	1.2	-			+
51	f	415	1.2	1.2	1.2	+			-
52	f	460	1.3	1.3	1.3	-			+
53	m	470	1.2	1.2	1.2	-			+
54	f	490	1.3	1.3	1.3	-			+
55	f	480	1.3	1.3	1.3	-			-
56	m	475	1.2	1.2	1.2	-			-
57	f	480	1.2	1.2	1.2	-			+
58	m	410	1.2	1.2	1.2	-			+
59	m	490	1.3	1.3	1.3	+			-
60	f	440	1.2	1.2	1.2	+			+
61	m	425	2.2	2.2	2.2	-			+
62	m	520	1.3	1.3	1.3	-			-
63	m	480	1.2	1.2	1.2	-			+
64	f	435	1.2	1.2	1.2	-			-
65	m	515	1.3	1.3	1.3	+			-
66	f	420	1.2	1.2	1.2	+			+
67	f	425	1.2	1.2	1.2	+			-
68	m	540	1.3	1.3	1.3	-			-
69	f	435	1.2	1.2	1.2	-			+
70	f	415	1.2	1.2	1.2	+			-
71	f	525	1.3	1.3	1.3	+			-
72	m	435	1.2	1.2	1.2	-			+
73	f	435	1.2	1.2	1.2	-			-
74	m	520	1.3	1.3	1.3	-			-
75	m	475	1.2	1.2	1.2	+			-
76	f	415	1.2	1.2	1.2	+			-
77	m	445	1.2	1.2	1.2	-			-
78	f	460	1.3	1.3	1.3	-			-
79	f	425	1.2	1.2	1.2	+			+
80	f	455	1.2	1.2	1.2	-			+

(Continued)

Appendix table I cont'd

Individual Data Records
Area 23 Commercial Fishery

Sample: 11
Date: JUL 4, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	
81	m	510	1.3	1.3	1.3	-			-
82	f	440	1.2	1.2	1.2	+			+
83	m	440	1.2	1.3	1.U	-			+
84	f	510	1.3	1.3	1.3	+			+
85	f	470	2.2	2.2	2.2	-			-
86	f	490	1.3	1.3	1.3	-			-
87	m	490	1.3	1.3	1.3	+			-
88	m	440	1.2	1.2	1.2	+			-
89	m	460	1.2	1.2	1.2	-			+
90	f	495	1.3	1.3	1.3	+			-
91	m	400	1.2	1.2	1.2	+			-
92	f	440	1.2	1.2	1.2	+			+
93	f	470	1.3	1.3	1.3	+			-
94	f	425	1.2	1.2	1.2	+			-
95	f	450	2.2	2.2	2.2	+			-
96	m	510	1.3	1.3	1.3	-			-
97	m	490	1.2	1.2	1.2	-			-
98	f	445	2.2	1.2	U.2	+			+
99	f	470	1.2	1.2	1.2	-			+
100	f	495	1.3	1.3	1.3	+			+

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	

Appendix table I cont'd

Individual Data Records
Area 23 Commercial Fishery

Sample: 12
Date: JUL 4, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	
1	m	440	1.2	1.2	1.2	-			
2	m	455	1.2	1.2	1.2	-			
3	f	500	1.3	1.3	1.3	-			
4	m	470	1.3	1.3	1.3	+			
5	f	450	1.3	1.3	1.3	-			
6	f	445	1.2	1.2	1.2	-			
7	m	445	1.2	1.2	1.2	+			
8	m	485	1.2	1.2	1.2	-			
9	f	405	2.2	2.2	2.2	-			
10	f	430	1.2	1.2	1.2	-			
11	m	455	1.2	2.2	U.2	-			
12	m	510	1.3	1.3	1.3	-			
13	f	525	1.3	1.3	1.3	-			
14	f	485	1.3	1.3	1.3	-			
15	f	435	2.2	2.2	2.2	-			
16	m	480	2.2	2.2	2.2	-			
17	m	500	1.3	1.3	1.3	+			
18	m	440	1.2	1.2	1.2	-			
19	f	490	1.3	1.3	1.3	-			
20	m	445	1.2	1.2	1.2	+			
21	f	425	1.2	1.2	1.2	+			
22	f	480	1.3	1.3	1.3	-			
23	m	515	1.2	1.3	1.U	-			
24	m	490	2.3	2.3	2.3	-			
25	m	405	1.2	1.2	1.2	-			
26	f	420	1.2	1.2	1.2	-			
27	f	510	1.3	1.3	1.3	-			
28	m	520	1.3	1.3	1.3	-			
29	f	440	1.3	1.3	1.3	+			
30	f	510	1.3	1.3	1.3	-			
31	f	440	1.2	1.2	1.2	+			
32	m	480	1.3	1.3	1.3	-			
33	m	425	1.2	1.2	1.2	+			
34	f	460	1.2	1.2	1.2	-			
35	m	405	1.2	2.2	U.2	+			
36	f	460	1.2	1.2	1.2	+			
37	m	435	1.2	1.2	1.2	-			
38	m	420	1.2	1.2	1.2	+			
39	f	410	1.2	1.2	1.2	-			
40	m	425	1.2	1.2	1.2	-			
41	m	580	1.3	1.3	1.3	-			
42	f	390	1.2	1.2	1.2	+			
43	m	520	1.3	1.3	1.3	-			
44	m	455	1.2	2.2	U.2	-			
45	f	480	1.3	1.3	1.3	-			
46	m	455	1.2	1.2	1.2	-			
47	m	545	1.3	1.3	1.3	-			
48	m	430	1.2	2.2	U.2	+			
49	m	480	1.2	1.2	1.2	-			
50	f	460	1.3	1.3	1.3	-			
51	m	425	1.2	1.2	1.2	-			
52	m	410	1.2	1.2	1.2	-			
53	m	490	1.3	1.3	1.3	-			
54	f	485	1.3	2.3	U.3	-			
55	m	490	1.3	1.3	1.3	+			
56	f	490	1.3	1.3	1.3	-			
57	f	490	1.3	1.3	1.3	-			
58	f	475	1.3	1.3	1.3	-			
59	f	490	1.3	1.3	1.3	+			
60	m	490	1.3	1.3	1.3	-			
61	f	455	R.2	2.2	2.2	-			
62	m	440	1.2	2.2	U.2	+			
63	f	450	1.2	1.2	1.2	+			
64	f	475	1.3	1.3	1.3	-			
65	f	450	2.2	2.2	2.2	+			
66	m	475	2.3	2.3	2.3	-			
67	f	470	1.3	1.3	1.3	+			
68	f	485	1.3	1.3	1.3	-			
69	m	415	2.2	2.2	2.2	+			
70	f	460	2.3	2.3	2.3	-			
71	m	440	1.2	1.2	1.2	-			
72	f	475	1.3	1.3	1.3	-			
73	m	440	1.2	1.2	1.2	+			
74	f	420	1.2	1.2	1.2	-			
75	f	500	1.3	1.3	1.3	-			
76	f	480	1.3	1.3	1.3	-			
77	m	515	1.3	1.3	1.3	-			
78	f	435	1.2	.	1.2	-			
79	f	475	1.3	1.3	1.3	-			
80	f	470	1.3	1.3	1.3	-			

(Continued)

Appendix table I cont'd

Individual Data Records
Area 23 Commercial Fishery

Sample: 12
Date: JUL 4, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	
81	f	480	1.3	1.3	1.3	-			
82	m	315	1.1	1.1	1.1	+			
83	m	405	1.2	1.2	1.2	-			
84	f	480	2.3	2.3	2.3	+			
85	f	460	1.3	1.3	1.3	-			
86	f	455	1.2	2.2	U.2	+			
87	m	405	1.2	1.2	1.2	-			
88	f	495	1.3	1.3	1.3	-			
89	m	440	1.2	1.2	1.2	-			
90	m	535	1.3	1.3	1.3	+			
91	f	400	1.2	1.2	1.2	+			
92	m	435	1.2	1.2	1.2	+			
93	f	485	1.3	1.3	1.3	+			
94	f	460	1.3	1.3	1.3	-			
95	f	445	1.3	1.3	1.3	-			
96	f	445	1.2	1.2	1.2	-			
97	f	485	1.3	2.3	U.3	+			
98	f	500	1.3	1.3	1.3	+			
99	f	480	1.3	1.3	1.3	-			
100	m	490	1.2	1.3	1.U	-			

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	

Appendix table I cont'd

Individual Data Records
Area 23 Commercial Fishery

Sample: 13
Date: JUL 9, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	
1	f	495	1.3	1.3	1.3	+	-	0	
3	f	500	2.3	2.3	2.3	-	-	1	
4	m	470	1.2	2.3	U.U	-	-	2	
5	f	505	1.3	1.3	1.3	-	-	2	
6	m	435	1.2	1.2	1.2	+	-	0	
7	f	505	1.3	1.3	1.3	-	-	0	
8	m	460	1.2	1.2	1.2	-	-	1	
9	m	410	1.2	1.2	1.2	+	-	0	
10	f	455	2.3	2.3	2.3	+	-	0	
11	m	460	1.2	1.2	1.2	-	-	0	
12	m	500	1.3	1.3	1.3	-	-	3	
13	m	420	1.2	1.2	1.2	-	-	0	
14	f	495	1.3	1.3	1.3	+	+	3	
15	m	450	1.2	1.2	1.2	+	-	0	
16	f	475	R.2	2.2	2.2	-	-	1	
17	m	450	1.2	1.2	1.2	+	-	0	
18	m	500	1.3	1.3	1.3	+	-	0	
19	f	465	1.3	1.3	1.3	+	-	0	
20	m	470	1.3	1.3	1.3	+	-	1	
21	f	480	1.3	1.3	1.3	-	-	3	
22	f	415	1.2	1.2	1.2	+	-	0	
23	m	470	1.2	1.2	1.2	-	-	4	
24	f	475	1.3	1.3	1.3	+	-	0	
25	f	475	1.3	1.3	1.3	-	-	2	
26	m	470	1.2	1.2	1.2	-	-	5	
27	f	440	1.2	1.2	1.2	+	-	0	
28	m	505	1.3	1.3	1.3	+	-	0	
29	m	470	1.2	1.2	1.2	+	+	1	
30	m	465	1.3	1.3	1.3	-	-	0	
31	f	505	1.3	1.3	1.3	-	-	3	
32	m	435	1.2	1.2	1.2	+	-	2	
33	f	420	1.3	1.3	1.3	-	-	0	
34	f	510	1.3	1.3	1.3	-	-	5	
35	f	455	1.3	1.3	1.3	+	-	0	
36	m	495	2.3	2.3	2.3	+	-	1	
37	m	490	1.2	1.2	1.2	+	-	0	
38	m	450	1.2	1.2	1.2	-	-	2	
39	m	435	1.2	1.2	1.2	-	-	4	
40	m	455	1.2	1.2	1.2	+	-	0	
41	f	495	1.3	1.3	1.3	-	-	0	
42	f	505	1.3	1.3	1.3	+	-	0	
43	m	400	2.2	1.3	U.U	-	-	1	
44	f	415	1.2	1.2	1.2	-	-	2	
45	m	425	1.2	1.2	1.2	+	-	1	
46	f	485	1.3	1.3	1.3	-	-	0	
47	m	450	1.2	1.2	1.2	-	-	3	
48	m	450	1.2	1.2	1.2	-	-	2	
49	m	470	1.2	1.2	1.2	-	-	1	
50	m	530	1.3	2.3	U.3	-	-	2	
51	m	430	1.2	1.2	1.2	+	-	0	
52	m	460	1.2	1.2	1.2	-	-	1	
53	m	415	1.2	1.2	1.2	-	-	1	
54	f	415	1.2	1.2	1.2	-	-	1	
55	m	450	1.2	1.2	1.2	+	-	0	
56	f	515	1.3	1.3	1.3	-	-	2	
57	m	550	1.3	1.3	1.3	-	-	4	
58	f	455	1.3	2.3	U.3	-	-	4	
59	f	475	1.2	1.2	1.2	-	-	0	
60	m	425	1.2	1.2	1.2	+	+	2	
61	m	485	1.2	1.2	1.2	-	-	4	
62	f	470	1.3	1.3	1.3	-	-	2	
63	m	495	1.3	1.3	1.3	-	-	5	
64	m	465	2.2	2.2	2.2	+	-	3	
65	f	455	1.2	1.2	1.2	-	-	2	
66	m	475	1.3	1.3	1.3	-	-	2	
67	m	535	1.3	1.3	1.3	+	-	2	
68	f	415	1.2	1.2	1.2	-	-	0	
69	m	415	1.2	1.2	1.2	+	+	2	
70	m	455	2.2	.	2.2	+	-	0	
71	m	420	1.2	1.2	1.2	-	-	1	
72	m	490	1.3	1.3	1.3	-	-	2	
73	m	420	1.2	1.2	1.2	-	-	0	
74	f	470	1.3	2.2	U.U	-	-	1	
75	f	485	1.3	1.3	1.3	-	-	3	
76	f	460	1.2	1.2	1.2	-	-	2	
77	f	430	2.2	2.2	2.2	-	-	3	
78	m	465	1.3	1.3	1.3	+	+	3	
79	m	475	1.3	1.3	1.3	+	-	3	
80	m	490	1.3	1.3	1.3	+	-	3	
81	f	480	1.2	1.2	1.2	-	-	0	

(Continued)

Appendix table I cont'd

Individual Data Records
Area 23 Commercial Fishery

Sample: 13
Date: JUL 9, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Hennequya	Diphyllobothrium	
82	m	465	1.2	1.2	1.2	+	-	0	
83	f	445	1.2	1.2	1.2	+	-	1	
84	f	465	1.3	1.3	1.3	-	-	0	
85	f	480	1.3	1.3	1.3	+	-	0	
86	f	415	1.2	2.2	U.2	-	-	4	
87	m	470	1.2	1.2	1.2	+	-	0	
88	m	540	1.3	1.3	1.3	+	-	0	
89	f	485	1.3	1.3	1.3	-	-	2	
90	f	425	1.2	1.2	1.2	+	-	0	
91	f	500	1.3	1.3	1.3	-	-	3	
92	f	495	1.3	1.3	1.3	-	-	1	
93		495	1.3	1.3	1.3	-	-	7	
94	m	490	1.3	1.3	1.3	+	-	1	
95	m	500	1.3	1.3	1.3	-	-	0	
96	f	450	1.3	1.3	1.3	-	-	2	
97	f	495	1.3	1.3	1.3	-	-	4	
98	m	420	1.2	1.2	1.2	-	-	0	
99	f	455	1.2	2.3	U.U	-	-	3	
100	f	490	1.3	1.3	1.3	+	-	3	

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Hennequya	Diphyllobothrium	

Appendix table I cont'd

Individual Data Records
Area 23 Commercial Fishery

Sample: 14
Date: JUL 9, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	
1	f	390	1.2	2.2	U.2	+	-	0	
2	m	445	1.2	1.2	1.2	+	-	0	
3	m	455	1.3	1.3	1.3	-	-	3	
4	f	430	1.2	1.2	1.2	+	-	1	
5	f	510	1.3	1.3	1.3	+	+	1	
6	m	540	1.3	1.3	1.3	-	-	5	
7	f	460	1.3	1.3	1.3	+	+	0	
8	m	435	1.2	1.2	1.2	+	-	2	
9	m	430	1.2	1.2	1.2	+	-	0	
10	m	515	1.3	1.3	1.3	+	+	0	
11	f	425	2.2	2.2	2.2	-	-	1	
12	m	540	1.3	1.3	1.3	-	-	0	
13	m	550	1.3	1.3	1.3	-	-	3	
14	m	395	1.2	2.2	U.2	-	-	3	
15	m	545	1.3	1.3	1.3	-	+	3	
16	m	490	1.3	1.3	1.3	+	-	1	
17	m	455	1.2	1.2	1.2	-	-	0	
18	f	425	1.2	1.2	1.2	-	-	0	
19	f	520	1.3	1.3	1.3	-	-	2	
20	f	405	2.2	2.2	2.2	-	-	0	
21	f	480	1.3	1.3	1.3	+	-	0	
22	f	440	1.3	1.2	1.U	+	-	0	
23	f	500	1.3	1.3	1.3	+	+	0	
24	m	470	1.3	1.3	1.3	-	-	4	
25	m	450	1.2	2.2	U.2	-	-	3	
26	m	520	1.3	1.3	1.3	+	+	0	
27	f	530	1.3	1.3	1.3	+	-	2	
28	m	455	1.2	1.2	1.2	-	-	1	
29	m	495	1.3	1.3	1.3	+	+	0	
30	f	480	1.3	1.3	1.3	+	+	1	
31	m	465	1.2	1.2	1.2	-	-	1	
32	m	455	1.2	1.2	1.2	+	-	1	
33	f	490	1.3	1.3	1.3	-	-	4	
34	m	485	1.2	1.2	1.2	-	-	1	
35	f	415	1.2	1.2	1.2	+	-	0	
36	f	420	1.2	1.2	1.2	+	+	0	
37	f	470	1.3	1.3	1.3	-	-	0	
38	f	500	1.3	1.3	1.3	+	+	0	
39	f	415	1.2	1.2	1.2	+	-	0	
40	f	480	1.2	1.2	1.2	-	-	1	
41	m	465	1.2	1.2	1.2	+	-	0	
42	m	435	1.2	1.2	1.2	+	-	0	
43	f	425	1.2	1.2	1.2	+	-	0	
44	m	450	1.3	1.3	1.3	+	+	2	
45	m	530	1.3	1.3	1.3	+	+	0	
46	f	470	1.2	1.2	1.2	-	-	1	
47	m	520	1.3	1.3	1.3	+	+	4	
48	f	470	1.3	1.3	1.3	+	+	0	
49	f	490	1.3	1.3	1.3	+	+	1	
50	m	480	1.3	1.3	1.3	-	-	1	
51	f	495	1.3	1.3	1.3	+	-	0	
52	m	460	1.2	1.2	1.2	-	-	1	
53	m	530	1.3	1.3	1.3	+	-	0	
54	m	415	1.2	1.2	1.2	+	-	0	
55	f	525	1.3	1.3	1.3	-	-	2	
56	m	500	1.3	1.3	1.3	-	-	3	
57	m	430	1.2	1.2	1.2	+	-	0	
58	m	455	1.2	1.2	1.2	-	-	4	
59	m	405	1.2	1.2	1.2	+	+	0	
60	m	440	1.2	1.2	1.2	-	-	5	
61	m	475	1.2	1.2	1.2	-	-	0	
62	f	520	1.3	1.3	1.3	-	-	4	
63	m	410	1.2	1.2	1.2	+	+	0	
64	m	540	1.3	2.3	U.3	-	-	1	
65	m	370	1.2	1.2	1.2	+	-	0	
66	f	415	1.2	1.2	1.2	-	-	0	
67	f	385	1.2	1.2	1.2	-	-	1	
68	f	470	1.3	1.3	1.3	-	-	3	
69	f	495	1.3	1.3	1.3	+	+	2	
70	m	420	1.2	1.2	1.2	-	-	0	
71	m	445	1.2	1.2	1.2	-	-	2	
72	m	510	1.3	1.3	1.3	-	-	4	
73	f	430	1.2	1.2	1.2	+	+	1	
74	m	460	1.3	1.3	1.3	+	-	0	
75	f	505	1.3	1.3	1.3	-	-	1	
76	m	515	1.3	1.3	1.3	-	-	0	
77	f	530	1.3	1.3	1.3	+	+	1	
78	f	390	1.2	1.2	1.2	-	-	3	
79	m	480	1.3	1.3	1.3	+	-	0	
80	m	500	1.3	1.3	1.3	-	-	5	

(Continued)

Appendix table I cont'd

Individual Data Records
Area 23 Commercial Fishery

Sample: 14
Date: JUL 9, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	
81	f	480	1.3	1.3	1.3	-	-	1	
82	m	465	1.2	1.2	1.2	-	-	4	
83	m	505	1.3	1.3	1.3	-	-	1	
84	f	475	1.2	1.2	1.2	-	-	2	
85	f	435	1.2	1.2	1.2	+	-	0	
86	m	485	1.3	1.3	1.3	+	-	0	
87	f	420	1.2	1.2	1.2	+	-	0	
88	f	485	2.3	2.3	2.3	+	+	0	
89	m	475	1.3	1.3	1.3	-	-	3	
90	f	425	1.2	1.2	1.2	-	-	5	
91	f	485	1.3	1.3	1.3	-	-	1	
92	f	430	1.2	1.2	1.2	-	-	0	
93	f	495	1.3	1.3	1.3	+	-	0	
94	m	505	1.3	1.3	1.3	-	-	1	
95	f	430	2.2	2.2	2.2	+	-	0	
96	m	440	2.3	2.3	2.3	-	-	3	
97	m	470	1.3	1.3	1.3	+	-	0	
98	m	510	1.3	1.3	1.3	+	+	0	
99	m	440	2.2	2.2	2.2	-	-	0	
100	f	480	2.3	2.3	2.3	-	-	1	

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	

Appendix table I cont'd

Individual Data Records
Area 23 Commercial Fishery

Sample: 15
Date: JUL 17, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	
1	f	415	1.2	1.2	1.2	-	-	2	
2	m	505	1.3	1.3	1.3	+	+	2	
3	f	420	1.2	1.2	1.2	+	+	0	
4	f	495	1.3	1.3	1.3	+	-	0	
5	m	475	1.2	1.2	1.2	+	-	1	
6	f	450	1.3	1.3	1.3	+	-	1	
7	m	435	1.2	1.2	1.2	-	-	2	
8	m	445	1.2	1.2	1.2	+	+	0	
9	f	420	1.2	1.2	1.2	+	-	1	
10	f	435	1.2	1.2	1.2	+	-	2	
11	f	420	2.2	2.2	2.2	+	-	0	
12	m	520	1.3	1.3	1.3	+	-	2	
13	f	425	1.2	1.2	1.2	-	-	3	
14	m	395	1.2	1.2	1.2	+	-	2	
15	f	470	1.3	1.3	1.3	+	+	4	
16	m	480	1.3	1.3	1.3	+	-	2	
17	f	475	1.3	1.3	1.3	+	-	2	
18	m	425	1.2	1.2	1.2	-	-	0	
19	f	450	1.2	1.2	1.2	+	-	0	
20	f	380	1.2	1.2	1.2	-	-	1	
21	m	460	2.2	2.2	2.2	-	-	8	
22	f	415	1.2	1.2	1.2	+	-	0	
23	m	465	2.2	2.2	2.2	-	-	2	
24	f	485	1.3	1.3	1.3	+	+	2	
25	f	465	1.3	1.3	1.3	+	-	0	
26	f	480	1.3	1.3	1.3	+	+	2	
27	f	530	1.3	1.3	1.3	+	+	6	
28	f	500	1.3	1.3	1.3	-	-	1	
29	m	525	1.3	1.3	1.3	-	-	1	
30	f	405	1.2	1.2	1.2	-	-	2	
31	m	435	1.2	1.2	1.2	-	-	2	
32	f	405	1.2	1.2	1.2	+	-	0	
33	m	500	1.3	1.3	1.3	+	-	0	
34	f	430	1.2	1.2	1.2	+	+	3	
35	f	475	1.2	1.3	1.U	+	-	0	
36	m	460	1.2	1.2	1.2	+	-	0	
37	m	545	1.3	1.3	1.3	-	-	3	
38	m	440	1.2	1.2	1.2	-	-	2	
39	m	460	1.2	1.2	1.2	-	-	1	
40	m	450	.	1.2	1.2	+	-	0	
41	f	390	1.2	1.2	1.2	+	-	1	
42	m	455	1.2	1.2	1.2	-	-	0	
43	f	440	1.2	1.2	1.2	-	-	1	
[illegible]	f	485	1.3	1.3	1.3	+	-	3	
45	f	425	1.2	1.2	1.2	-	-	3	
46	f	445	1.3	1.3	1.3	-	-	1	
47	m	515	1.3	2.3	U.3	+	+	1	
48	m	420	1.2	1.2	1.2	-	-	0	
49	m	410	1.2	1.2	1.2	-	-	1	
50	m	400	1.2	2.2	U.2	-	-	2	
51	m	470	1.3	1.3	1.3	+	-	0	
52	f	430	1.2	1.2	1.2	+	-	0	
53	f	450	1.3	1.3	1.3	+	+	0	
54	f	425	1.2	1.2	1.2	-	-	2	
55	f	460	1.3	1.3	1.3	-	-	0	
56	f	475	1.3	1.3	1.3	+	+	2	
57	f	505	1.3	1.3	1.3	+	+	0	
58	m	495	1.3	1.3	1.3	+	-	0	
59	m	470	1.2	1.2	1.2	+	-	0	
60	m	395	1.2	1.2	1.2	-	-	0	
61	f	480	1.3	1.3	1.3	+	-	5	
62	f	470	1.3	1.3	1.3	-	-	1	
63	f	505	1.3	1.3	1.3	-	-	3	
64	m	455	1.2	1.2	1.2	-	-	0	
65	m	485	1.2	1.2	1.2	+	+	0	
66	f	450	1.3	1.3	1.3	-	-	1	
67	m	425	1.2	1.2	1.2	-	-	2	
68	m	455	2.2	2.2	2.2	-	-	0	
69	f	455	1.3	1.3	1.3	+	+	0	
70	f	475	1.3	1.3	1.3	-	-	5	
71	m	455	1.3	1.3	1.3	+	+	0	
72	m	430	R.2	2.2	2.2	+	-	0	
73	f	525	1.3	1.3	1.3	+	+	0	
74	m	515	1.3	2.3	U.3	-	-	2	
75	f	455	1.2	1.2	1.2	+	+	0	
76	m	510	1.3	1.3	1.3	+	+	1	
77	f	395	1.2	1.2	1.2	-	-	2	
78	f	445	.	1.2	1.2	+	+	0	
79	m	425	1.2	1.2	1.2	+	-	5	
80	f	470	1.3	1.3	1.3	+	+	5	

(Continued)

Appendix table I cor/'d

Individual Data Records
Area 23 Commercial Fishery

Sample: 15
Date: JUL 17, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Hannaeguya	Diphyllobothrium	
81	f	495	1.3	1.3	1.3	+	+	0	
82	m	545	1.3	1.3	1.3	+	-	0	
83	m	420	1.2	1.2	1.2	-	-	1	
84	m	515	1.3	1.3	1.3	-	-	4	
85	m	435	1.2	1.2	1.2	-	+	0	
86	f	410	1.2	1.2	1.2	-	-	1	
87	f	425	2.2	2.2	2.2	-	-	4	
88	f	495	1.3	1.3	1.3	-	-	1	
89	m	430	2.2	2.2	2.2	-	-	4	
90	f	500	1.3	2.3	U.3	+	-	0	
91	m	390	1.2	1.2	1.2	+	-	0	
92	f	425	1.2	1.2	1.2	+	-	1	
93	m	435	1.3	1.3	1.3	-	-	3	
94	f	475	1.3	1.3	1.3	+	+	0	

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Hannaeguya	Diphyllobothrium	

Appendix table I cont'd

Individual Data Records
Area 23 Commercial Fishery

Sample: 16
Date: JUL 17, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	
1	m	485	1.3	1.3	1.3	+	-	0	
2	m	460	1.2	1.2	1.2	+	-	0	
3	m	525	1.3	1.3	1.3	-	-	1	
4	m	505	1.3	1.3	1.3	-	-	1	
5	m	435	1.2	1.2	1.2	-	-	1	
6	m	455	1.2	1.2	1.2	-	-	0	
7	m	415	1.2	1.2	1.2	+	-	0	
8	m	475	1.2	1.2	1.2	-	-	3	
9	m	430	1.2	1.2	1.2	+	-	0	
10	m	500	1.3	1.3	1.3	-	-	4	
11	f	445	1.3	1.3	1.3	+	-	1	
12	m	525	1.3	1.3	1.3	-	-	8	
13	m	515	1.3	1.3	1.3	-	-	4	
14	f	505	1.3	1.3	1.3	-	-	2	
15	f	485	1.3	1.3	1.3	-	-	9	
16	f	500	1.3	1.3	1.3	-	-	1	
17	f	460	1.2	1.2	1.2	+	-	0	
18	f	425	1.2	1.2	1.2	+	-	0	
19	m	435	2.2	2.2	2.2	-	-	1	
20	m	455	2.2	2.2	2.2	-	-	0	
21	m	440	1.3	1.3	1.3	-	-	1	
22	m	515	1.3	1.3	1.3	-	-	0	
23	m	505	2.3	1.3	U.3	+	-	0	
24	f	470	1.3	1.3	1.3	-	-	2	
25	m	475	1.2	1.2	1.2	+	-	1	
26	m	405	1.3	1.3	1.3	-	-	0	
27	f	440	1.2	1.2	1.2	-	-	2	
28	f	465	1.3	1.3	1.3	-	-	4	
29	f	485	1.3	1.3	1.3	+	-	0	
30	m	485	1.3	1.3	1.3	+	-	1	
31	f	490	R.R	1.3	1.3	-	-	1	
32	f	485	1.3	1.3	1.3	-	-	5	
33	m	320	1.2	1.2	1.2	+	-	0	
34	m	430	1.2	1.2	1.2	+	-	0	
35	f	455	1.3	1.3	1.3	-	-	6	
36	m	475	1.3	1.3	1.3	-	-	4	
37	m	405	1.2	1.2	1.2	-	-	2	
38	m	425	1.2	1.2	1.2	-	-	0	
39	f	475	1.3	1.3	1.3	-	-	0	
40	m	495	1.2	1.2	1.2	-	-	2	
41	m	455	1.2	1.2	1.2	-	-	3	
42	m	455	1.2	1.2	1.2	-	-	4	
43	f	395	1.2	1.2	1.2	-	-	4	
44	f	485	1.3	1.3	1.3	+	-	1	
45	f	470	1.3	1.3	1.3	-	-	1	
46	f	465	1.3	1.3	1.3	+	-	0	
47	m	435	1.2	1.2	1.2	+	-	0	
48	m	440	1.2	1.2	1.2	+	-	2	
49	m	525	1.3	1.3	1.3	+	-	0	
50	f	425	1.2	1.2	1.2	-	-	3	
51	m	520	1.3	1.3	1.3	-	-	0	
52	f	415	1.2	1.2	1.2	-	-	6	
53	f	425	1.2	1.2	1.2	+	-	0	
54	m	520	1.3	1.3	1.3	-	-	6	
55	m	460	1.3	1.3	1.3	-	-	5	
56	m	505	1.3	1.3	1.3	+	+	0	
57	f	450	R.2	1.2	1.2	-	-	0	
58	f	470	1.3	1.3	1.3	-	-	1	
59	f	445	2.2	2.2	2.2	-	-	4	
60	f	475	1.3	1.3	1.3	-	-	5	
61	f	405	2.2	2.2	2.2	-	-	5	
62	f	450	1.2	1.2	1.2	+	-	0	
63	m	425	1.2	1.2	1.2	+	-	0	
64	m	450	1.2	1.2	1.2	-	-	0	
65	f	420	1.2	1.2	1.2	-	-	2	
66	m	480	1.3	1.3	1.3	-	-	1	
67	m	520	1.3	1.3	1.3	+	-	3	
68	m	460	1.2	1.2	1.2	-	-	1	
69	m	520	1.3	1.3	1.3	-	-	1	
70	m	480	1.3	1.3	1.3	-	-	5	
71	m	495	1.3	1.3	1.3	+	-	0	
72	m	505	1.3	1.3	1.3	-	-	5	
73	f	420	1.2	1.2	1.2	-	-	1	
74	f	480	1.3	1.3	1.3	-	-	3	
75	m	440	1.2	1.2	1.2	+	-	0	
76	f	445	2.2	2.2	2.2	-	-	3	
77	m	470	1.3	1.3	1.3	+	-	2	
78	f	420	1.2	1.2	1.2	+	-	1	
79	m	495	1.3	1.3	1.3	-	-	7	
80	m	485	1.3	1.3	1.3	+	-	0	

(Continued)

Appendix table I cont'd

Individual Data Records
Area 23 Commercial Fishery

Sample: 16
Date: JUL 17, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	
81	f	460	1.2	1.2	1.2	-	-	0	
82	f	425	2.2	2.2	2.2	-	-	7	
83	m	425	1.2	1.2	1.2	+	-	0	
84	m	495	1.3	1.3	1.3	-	-	6	
85	m	510	1.3	1.3	1.3	-	-	4	
86	m	485	1.3	1.3	1.3	+	-	0	
87	f	445	1.3	1.3	1.3	+	-	0	
88	m	510	R.3	1.3	1.3	-	-	1	
89	f	395	1.2	1.2	1.2	-	-	0	
90	f	465	1.3	1.3	1.3	+	-	1	
91	f	400	2.2	2.2	2.2	+	-	4	
92	f	465	2.2	2.2	2.2	-	-	3	
93	m	445	1.2	1.2	1.2	-	-	2	
94	f	435	1.3	1.3	1.3	-	-	1	
95	m	295	1.1	1.1	1.1	-	-	0	
96	m	500	1.3	1.3	1.3	+	-	2	
97	f	380	1.2	1.2	1.2	+	-	0	
98	f	495	1.3	1.3	1.3	-	-	0	
99	f	510	1.3	1.3	1.3	-	-	1	
100	f	475	1.3	1.3	1.3	-	-	6	

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	

Appendix table I cont'd

Individual Data Records
Area 23 Commercial Fishery

Sample: 17
Date: JUL 17, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	
1	m	465	2.2	2.2	2.2	-	-	2	+
2	f	410	1.2	1.2	1.2	-	-	0	-
3	f	435	1.2	1.2	1.2	-	-	1	+
4	m	405	1.2	1.2	1.2	-	-	0	+
5	f	495	R.3	1.3	1.3	-	-	0	-
6	m	395	1.2	1.2	1.2	-	-	0	+
7	m	525	1.3	1.3	1.3	-	-	0	-
8	f	460	1.3	1.3	1.3	-	-	0	+
9	f	490	1.3	1.3	1.3	+	+	0	+
10	m	505	1.3	1.3	1.3	+	+	0	+
11	f	515	1.3	1.3	1.3	+	+	1	-
12	f	395	1.2	1.2	1.2	+	-	0	-
13	m	405	1.2	1.2	1.2	-	-	2	-
14	m	425	1.2	1.2	1.2	+	+	2	-
15	f	415	1.2	2.2	U.2	+	-	1	-
16	f	440	1.2	1.2	1.2	+	-	1	+
17	m	495	1.3	1.3	1.3	+	+	0	-
18	f	405	.	1.2	1.2	+	-	2	+
19	m	455	1.2	1.2	1.2	+	-	1	+
20	m	495	2.3	2.3	2.3	+	+	3	-
21	f	490	1.3	1.3	1.3	-	-	2	+
22	m	460	1.2	1.2	1.2	-	-	3	-
23	m	505	1.3	1.3	1.3	+	-	0	-
24	f	460	1.2	1.2	1.2	-	-	1	+
25	m	450	1.2	1.2	1.2	-	-	3	+
26	f	490	1.3	1.3	1.3	+	+	0	-
27	f	420	2.2	2.2	2.2	-	+	2	-
28	m	435	1.2	1.2	1.2	-	-	1	-
29	f	520	2.3	2.3	2.3	-	-	0	+
30	f	485	1.2	1.2	1.2	+	-	0	+
31	m	520	1.3	1.3	1.3	+	-	1	-
32	m	435	1.2	1.2	1.2	-	-	2	+
33	m	455	1.2	1.2	1.2	+	+	0	-
34	m	465	1.2	1.2	1.2	+	+	0	-
35	m	405	1.2	2.2	U.2	-	-	1	-
36	m	425	1.2	1.2	1.2	+	-	0	+
37	f	455	1.3	1.3	1.3	-	-	0	-
38	f	490	1.3	1.3	1.3	-	-	3	+
39	f	440	1.2	1.2	1.2	+	-	0	-
40	f	495	1.3	1.3	1.3	+	+	0	+
41	m	425	1.2	1.2	1.2	+	-	1	+
42	f	440	1.2	1.2	1.2	-	-	2	+
43	m	520	1.3	1.3	1.3	+	-	0	+
44	m	500	2.3	2.3	2.3	-	-	2	+
45	m	470	1.2	1.2	1.2	-	-	0	+
46	m	430	1.2	1.2	1.2	+	-	0	-
47	f	475	1.3	1.3	1.3	+	+	0	+
48	f	425	1.2	1.2	1.2	-	-	1	+
49	m	455	1.2	1.2	1.2	+	-	1	+
50	m	485	1.3	2.3	U.3	+	+	2	-
51	f	415	1.2	1.2	1.2	+	-	0	-
52	f	495	1.3	1.3	1.3	+	-	0	-
53	f	490	1.3	1.3	1.3	-	-	0	+
54	m	460	1.2	1.2	1.2	+	+	0	-
55	m	445	1.2	1.2	1.2	-	-	0	-
56	f	430	2.2	2.2	2.2	+	-	0	-
57	f	425	1.2	1.2	1.2	-	-	0	+
58	f	505	1.3	1.3	1.3	+	-	0	-
59	f	480	1.3	1.3	1.3	+	+	1	+
60	f	405	1.2	1.2	1.2	-	-	0	-
61	m	425	1.2	1.2	1.2	+	-	1	+
62	f	435	1.2	1.2	1.2	-	-	3	+
63	f	465	1.2	2.2	U.2	-	-	2	+
64	m	430	1.2	1.2	1.2	-	-	0	+
65	f	475	2.3	2.3	2.3	+	-	1	-
66	f	490	1.3	1.3	1.3	-	-	1	+
67	m	435	2.2	2.2	2.2	-	+	0	-
68	m	460	1.2	1.2	1.2	-	-	1	+
69	f	425	1.3	1.3	1.3	+	+	5	+
70	m	450	1.2	1.2	1.2	+	-	0	+
71	f	495	1.3	1.3	1.3	-	-	0	-
72	m	490	1.3	1.3	1.3	-	-	0	+
73	m	455	1.2	1.2	1.2	-	-	0	+
74	m	505	1.3	1.3	1.3	+	-	0	-
75	f	440	1.2	1.2	1.2	+	+	0	-
76	m	455	R.2	1.2	1.2	-	-	2	-
77	m	315	1.1	1.1	1.1	+	-	0	-
78	m	455	1.2	1.2	1.2	+	-	0	-
79	f	435	1.2	1.2	1.2	+	-	0	+
80	f	415	1.2	1.2	1.2	-	-	2	+

(Continued)

Appendix table I cont'd

Individual Data Records
Area 23 Commercial Fishery

Sample: 17
Date: JUL 17, 1984

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	
82	f	490	1.3	1.3	1.3	+	-	1	+
83	f	470	1.3	1.3	1.3	-	-	5	-
84	m	475	1.3	1.3	1.3	+	+	2	-
85	f	420	.	1.3	1.3	-	-	2	+
86	m	450	1.3	1.3	1.3	+	-	2	-
87	m	445	1.2	1.2	1.2	-	-	2	-
88	f	475	1.3	1.3	1.3	+	-	2	-
89	f	360	1.2	1.2	1.2	+	-	0	-
90	f	500	1.3	1.3	1.3	-	-	0	+
91	m	485	1.3	1.3	1.3	+	-	0	+
92	f	445	1.2	1.2	1.2	+	-	0	+
93	f	470	1.3	1.3	1.3	-	-	4	-
94	m	470	1.2	1.2	1.2	-	-	2	-
95	f	395	2.2	2.2	2.2	+	-	0	-
96	f	410	1.2	1.2	1.2	-	-	2	+
97	f	480	1.3	1.3	1.3	+	-	0	+
98	m	500	1.3	1.3	1.3	+	-	0	-
99	f	450	.	2.3	2.3	+	-	2	+
100	f	470	1.3	1.3	1.3	-	-	7	+

Fish	Sex	POH Length (mm)	Age			Parasite			Net Mark
			Scale	Otolith	Reconciled	Myxobolus	Henneguya	Diphyllobothrium	